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1988-1993

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Three working papers dealing with reserve aviation, aircraft display symbology, and aviation simulator task training.

15. SUBJECT TERMS

reserve aviation, aircraft display symbology, aviation simulator task training.

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Weeter, R.D. (1990). A review of factors influencing the design and evaluation of aircraft display symbology. WP ARIARDA 90-01.

Wightman, D.C. (1993). Army aviation simulator task training capabilities: A review of ARIARDA work. WP ARIARDA 93-01.

December 21, 1987

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FIRST U.S. ARMY RESERVE AVIATOR QUESTIONNAIRE DATA SUMMARY

U.S. Army Research Institute
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5001 Eisenhower Avenue, Alexandria, VA 22333

Human Factors Research in
Aircrew Performance and Training
MDA903-87-C-0523
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WORKING PAPER

FIRST U.S. ARMY RESERVE AVIATOR QUESTIONNAIRE DATA SUMMARY

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December 21, 1987

FIRST U.S. ARMY RESERVE AVIATOR QUESTIONNAIRE DATA SUMMARY

EXECUTIVE SUMMARY

Objectives:

This Working Paper summarizes the findings of a questionnaire survey of First U. S. Army Reserve (USAR) aviators. The survey was conducted by the Army Research Institute Aviation Research and Development Activity (ARIARDA) at the request of the Deputy Chief of Staff for Training (DCST), First U. S. Army. The survey was conducted to assess the opinions of First Army reserve aviators about current aviation training requirements and to identify key military and civilian demographic characteristics. In addition, the First Army DCST was interested in comparing the results of the present survey with those from a recent survey of Army National Guard aviators conducted by ARIARDA for the National Guard Bureau (Szabo, Ruffner, Cross, & Sanders, 1986).

Approach:

A questionnaire survey was developed to meet the project objectives. A copy of the questionnaire is provided in the appendix. The questionnaire was designed to obtain the following information from aviators in First Army reserve units:

- the aviators' perceptions of the adequacy of the training requirements for maintaining a safe level of aviator proficiency,
- the aviators' perceptions of the adequacy of the training time allocated for meeting the requirements,
- the aviators' willingness to spend additional training time to meet the requirements,
- the characteristics of the training environment that were judged to be obstacles to training,
- key military and civilan demographic characteristics, and
- the aviators' career intentions.

A total of 139 questionnaires was completed and returned to ARIARDA between April 1987 and June 1987. This represents a return rate of approximately 55 percent.

Results:

In general, the results of the survey are similar to the results of the Army National Guard (ARNG) survey (Szabo et al., 1986), with a few minor differences. Five general conclusions can be drawn from the data:

- First Army reserve aviators have somewhat lower experience levels (e.g., flight hours, time in service, percent with combat experience) than aviators in the ARNG.
- Similar to ARNG aviators, First Army reserve aviators are generally satisfied with their civilian and USAR jobs and generally intend to stay in the USAR until they are eligible for at least a 20-year retirement. Factors that influence aviators to remain in the USAR include the opportunity to fly, pay, and retirement benefits. Factors that may influence aviators to leave the USAR include administrative details and politics, unrealistic training goals for the time and resources allocated, and loss of flight status.
- First Army reserve aviators generally rate the amount of time available to meet continuation training requirements as inadequate and are willing to spend additional paid time to meet the requirements. This finding is consistent with the results from the ARNG aviation survey.
- Similar to ARNG aviators, First Army reserve aviators judge that the unavailability of instructor pilots, an insufficient number of flight hours, the unavailability of training areas, and the unavailability of aircraft are the major obstacles to meeting continuation training requirements. The aviators judge that an insufficient amount of personal time is a major obstacle to meeting additional military requirements. In general, the unavailability of resources appears to be a more serious problem for First Army reserve aviators than it is for ARNG aviators.
- First Army reserve aviators judge that they need 10 more Additional Flight Training Periods (AFTPs) per year to meet the current training requirements. The aviators indicate that they could afford to spend approximately 8 additional paid hours each month meeting the training requirements. No comparable data are available from the ARNG survey.

Cautions:

When interpreting the data, it is important to note that the First USAR questionnaire data are based on a smaller sample than the ARNG questionnaire data, and that the two surveys were administered approximately three years apart.

Organization of the Working Paper:

The First USAR questionnaire data are summarized for the total sample and for subsamples of commissioned officers and warrant officers. Each questionnaire item is listed in abbreviated form, along with an appropriate summary measure. Categorical questions (e.g., rank) are summarized using percentages. The 7-point rating scale items (e.g., Rating of Adequacy of the Amount of Time Allocated for Meeting the Training Requirements) are summarized using means and standard deviations. The low and high anchors for each scale are presented in addition to the summary statistics. The remaining questions (e.g., flight hours) are summarized using the median value.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AASF	Army Aviation Support Facility
A/C	Aircraft
ADT	Active Duty for Training
AFTP	Additional Flight Training Period
AGR	Army Guard and Reserve
AREAS	Training Support Areas
ARIARDA	Army Research Institute Aviation Research and Development Activity
ARNG	Army National Guard
CH	Cargo Helicopter
CW	Chief Warrant
DCST	Deputy Chief of Staff for Training
EH	Electronics Helicopter
EQUIP	Support Equipment
FH	Flight Hours
GED	General Education Development
IERW	Initial Entry Rotary Wing
IP	Instructor Pilot
IPS	Instructor Pilots
MTOE	Modification Table(s) of Organization and Equipment
MUTA	Multiple Unit Training Assembly
NOE	Nap-of-the-Earth
NON-AV	Non-aviation Obstacles
NVG	Night Vision Goggle
OH	Observation Helicopter
PERS	Support Personnel
PMOS	Primary Military Occupational Specialty
SFTS	Synthetic Flight Training Simulator
SIP	Standardization Instructor Pilot
SSI	Specialty Skill Identifier
TDA	Table(s) of Distribution and Allowances
TIME	Personal Time
TOE	Table(s) of Organization and Equipment
UH	Utility Helicopter
USAR	U. S. Army Reserve
UT	Unit Trainer
UTA	Unit Training Assembly
WO	Warrant Officer

FIRST U.S.ARMY RESERVE AVIATOR
QUESTIONNAIRE DATA SUMMARY

CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

DATA SUMMARY FOR THE TOTAL SAMPLE

(n = 139)

Summary of Requirements Ratings: Total Sample (N=139)

PART I: TRAINING REQUIREMENTS

A. Ratings of the Adequacy of the Training Requirements For Maintaining a Safe Level of Proficiency

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	74	3.6	1.5
Unaided Night Tactical Flight	63	3.3	1.5
Night Vision Goggles	35	2.4	1.5
Nuclear, Biological, Chemical Flight	63	2.9	1.5
Other Tasks	21	3.6	1.6

Transition Training Requirements

Alternate/Additional Aircraft	44	4.3	1.2

Continuation Training Requirements

Emergency Tasks	94	3.6	1.4
Emergency Procedures	92	4	1.2
Instrument Tasks	94	4	1.2
Terrain Flight (NOE) Tasks	88	3.3	1.4
Unaided Night Tactical Tasks	73	3.2	1.3
Night Vision Goggle (NVG) Tasks	32	2	1.3
Tactical/Special Tasks	77	3.4	1.5
Mission Tasks	92	4	1.3
Additional Tasks	83	3.9	1.2
Other Tasks	12	3.2	0.9

Additional Military Requirements

Inflight Evaluation/Training of Aviators	63	4.2	1.1
Pre- and Postflight Tasks	97	4.6	1.3
Training in Aviation Academic Subjects	96	3.7	1.3
Nonflying Aviation Evaluations	96	4	1.2
Military Education Requirements	93	3.6	1.5
Preparation for Inspections	91	3.9	1.6

*Scale anchors:

1 = Much less than adequate for a safe level of proficiency

7 = Much more than adequate for a safe level of proficiency

B. Ratings of the Adequacy of the Time Allocated For Meeting the Training Requirements

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	74	2.8	1.2
Unaided Night Tactical Flight	64	2.7	1.1
Night Vision Goggles	29	2.1	1.2
Nuclear, Biological, Chemical Flight	62	2.8	1.3
Other Tasks	13	3.2	1.2

Transition Training Requirements

Alternate/Additional Aircraft	45	3.6	1.2

Continuation Training Requirements

Emergency Tasks	94	3.2	1.1
Emergency Procedures	93	3.5	1
Instrument Tasks	94	3.5	1.2
Terrain Flight (NOE) Tasks	89	2.9	1.2
Unaided Night Tactical Tasks	75	2.9	1.2
Night Vision Goggle (NVG) Tasks	33	2	1.2
Tactical/Special Tasks	81	3.2	1.1
Mission Tasks	91	3.7	1.1
Additional Tasks	83	3.5	1.1
Other Tasks	13	3.5	1.4

Additional Military Requirements

Inflight Evaluation/Training of Aviators	65	3.5	1
Pre- and Postflight Tasks	96	4	1.2
Training in Aviation Academic Subjects	96	3.3	1.1
Nonflying Aviation Evaluations	97	3.5	1.1
Military Education Requirements	93	3.3	1.3
Preparation for Inspections	89	3.6	1.6

*Scale anchors:
1 = Too little time is allocated to the task
7 = Too much time is allocated to the task

C. Ratings of the Willingness to Spend Additional Paid Time To Meet the Training Requirements

Qualification Requirements	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	77	5.5	1.6
Unaided Night Tactical Flight	72	5.4	1.6
Night Vision Goggles	59	5.2	1.8
Nuclear, Biological, Chemical Flight	74	4.5	1.8
Other Tasks	31	5.1	2.1

Transition Training Requirements			
Alternate/Additional Aircraft	62	5.7	1.5

Continuation Training Requirements			
Emergency Tasks	96	5.6	1.5
Emergency Procedures	95	5.3	1.7
Instrument Tasks	95	5.5	1.5
Terrain Flight (NOE) Tasks	92	5.3	1.7
Unaided Night Tactical Tasks	86	5.2	1.7
Night Vision Goggle (NVG) Tasks	66	5.2	1.8
Tactical/Special Tasks	91	5.1	1.7
Mission Tasks	94	5.3	1.6
Additional Tasks	88	5.2	1.6
Other Tasks	27	5.2	2

Additional Military Requirements			
Inflight Evaluation/Training of Aviators	68	5.2	1.6
Pre- and Postflight Tasks	98	4.8	1.7
Training in Aviation Academic Subjects	98	5.1	1.6
Nonflying Aviation Evaluations	98	4.9	1.6
Military Education Requirements	97	4.4	1.8
Career Development	98	5	1.7
Additional Nonflying Duties	98	4.3	2
Preparation for Inspections	94	4.1	1.9

*Scale anchors:
1 = Very unwilling to spend additional paid training time
7 = Very willing to spend additional paid training time

D. Ratings of the Willingness to Spend Additional Nonpay Status Time To Meet the Training Requirements

Qualification Requirements	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	81	3.1	2.1
Unaided Night Tactical Flight	73	3.1	2.1
Night Vision Goggles	60	3.3	2.1
Nuclear, Biological, Chemical Flight	76	2.5	1.8
Other Tasks	35	2.9	2.1
Transition Training Requirements			
Alternate/Additional Aircraft	61	3.2	2.3
Continuation Training Requirements			
Emergency Tasks	97	3.1	2.1
Emergency Procedures	97	3	2
Instrument Tasks	96	3.1	2.1
Terrain Flight (NOE) Tasks	95	3	2.2
Unaided Night Tactical Tasks	86	3	2.1
Night Vision Goggle (NVG) Tasks	66	3.1	2.2
Tactical/Special Tasks	91	2.9	2
Mission Tasks	96	2.9	2.1
Additional Tasks	91	2.9	2.1
Other Tasks	40	2.8	2.1
Additional Military Requirements			
Initial Flight Aptitude/Training of Aviators	72	2.8	2
Pre- and Postflight Tasks	98	2.7	1.9
Training in Aviation Academic Subjects	98	2.9	1.9
Proficiency Aviation Evaluations	98	2.6	1.8
Military Qualification Requirements	97	2.4	1.7
Career Development	98	2.9	2.1
Additional Assigned Duties	96	2.3	1.6
Preparation for Inspections	91	2.4	1.6

*Scale anchors:

1 = Very unwilling to spend additional nonpay status training time

7 = Very willing to spend additional nonpay status training time

E. Percent of the Aviators Identifying Characteristics of the Training Environment as Obstacles to Training

Qualification Requirements	Percent Applicable	Percent Identifying Characteristic as Obstacle to Training: IPS	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
Terrain (NOE) Flight	74	38	15	50	19	25	60	28	20	16
Unaided Night Tactical Flight	64	39	16	19	22	33	35	27	19	25
Night Vision Goggles	46	48	15	23	71	26	36	26	13	19
Nuclear, Biological, Chemical Flight	64	30	16	7	45	19	12	19	19	22
Other Tasks	34	38	17	24	28	28	10	24	14	17
Transition Training Requirements										
Alternate/Additional Aircraft	45	51	8	47	20	20	6	29	20	33
Continuation Training Requirements										
Emergency Tasks	91	60	8	25	10	25	7	31	25	21
Emergency Procedures	88	47	12	12	16	19	15	17	24	32
Instrument Tasks	89	53	8	39	19	26	11	25	22	17
Terrain Flight (NOE) Tasks	88	43	12	25	12	22	51	27	24	19
Unaided Night Tactical Tasks	74	38	13	27	17	30	31	30	19	26
Night Vision Goggle (NVG) Tasks	49	56	19	33	61	27	38	27	19	25
Tactical/Special Tasks	81	44	15	28	15	21	27	26	23	18
Mission Tasks	83	40	16	34	20	27	17	25	28	20
Additional Tasks	78	37	15	29	12	25	18	30	29	23
Other Tasks	35	36	20	36	28	32	12	24	24	32
Additional Military Requirements										
Inflight Evaluation/Training of Aviators	60	54	15	21	15	18	5	24	22	24
Non-Training Flights	82	10	16	25	14	16	0	33	19	37
Pre- and Postflight Tasks	78	19	25	10	15	22	3	13	26	35
Nonflying Aviation Evaluations	82	24	15	5	6	21	2	10	23	45
Military Education Requirements	82	14	23	5	11	13	6	7	26	55
Career Development	82	10	15	4	4	11	4	8	24	66
Additional Nonflying Duties	84	7	13	4	7	10	2	7	29	69
Preparation for Inspections	83	8	15	5	6	11	3	5	19	68

Summary of Demographic/Background Information: Total Sample (N=139)

PART II: BACKGROUND INFORMATION

A. Personal Characteristics

1. Age (median)

37 Years

2. Sex (percent)

3.6 Female
96.4 Male

3. Ethnic group (percent)

0.7 American Indian
0.7 Asian
2.2 Black
95.7 Caucasian
0.7 Hispanic
0 Other

4. Marital status (percent)

25.9 Single - never married
51.8 Married - never divorced
10.8 Married - previously divorced
5.8 Divorced - not remarried
5.8 Separated
0 Widow/Widower

5. Number of children at home (median)

2 Children

6. Highest civilian education (percent)

0 Some high school
4.3 High School grad/GED
2.9 Trade or tech school
35.3 Some college (no degree)
15.1 Associate degree
30.2 Bachelors degree
9.4 Masters degree
0.7 Ph.D. Degree
2.2 OD or professional degree

7. Hours in community activities (median)

0 hours per week

B. Military Characteristics

9. Primary aircraft - rotary wing (percent, median)

56.8	UH-1H	600	Hours
14.4	UH-1V	100	Hours
0	UH-60	-	Hours
0	EH-1H	-	Hours
11.5	OH-58	363	Hours
10.1	CH-47	700	Hours
0	Other	-	Hours

Primary aircraft - fixed wing (percent)

0	T-42	-	Hours
0	U-3	-	Hours
1.4	U-8	-	Hours
5	U-21	-	Hours
0.7	Other	-	Hours

10. Current in other types of aircraft? (percent)

43.5	Yes
56.5	No

11. Total military flight hours (median)

1425 Hours

Civilian flight hours in military aircraft (median)

1000 Hours

Civilian flight hours in civilian aircraft (median)

500 Hours

Logged combat flight hours? (percent)

39	Yes
61	No

Combat flight hours (median of aviators with combat experience)

1000 Hours

Summary of Demographic/Background Information: **Total Sample (N=139)**

12. **Highest qualifications** (percent for each aircraft)

	n	Pilot	UT	IP	SIP
UH-1H	98	80.6	4.1	11.2	4.1
UH-1V	24	87.5	4.2	8.3	0
UH-60	2	100	0	0	0
EH-1H	0	0	0	0	0
OH-58	29	93.1	0	0	6.9
CH-47	13	76.9	0	15.4	7.7
Other	3	66.7	0	33.3	0
T-42	2	50	0	0	50
U-3	1	0	0	100	0
U-8	10	60	10	10	20
U-21	12	66.7	0	25	8.3
Other	3	66.7	0	0	33.3

13. **Aviation qualifications** (percent)

95.7 Instrument Ticket
79.9 Terrain Flight (NOE)
51.1 Unaided Night Tactical
28.1 Night Vision Goggles
12.9 Safety Officer
11.5 Maintenance Officer
10.8 Maintenance Test Pilot
5 Rotary Wing Instrument Flight Examiner
2.9 Fixed Wing Instrument Flight Examiner
1.4 Maintenance Test Flight Examiner
0.5 Other

14. Income from USAR job (percent)

0	Less than $1,000
1.5	$1,000 to 1,999
3	$2,000 to 2,999
10.4	$3,000 to 3,999
8.1	$4,000 to 4,999
13.3	$5,000 to 5,999
13.3	$6,000 to 6,999
17.8	$7,000 to 7,999
11.1	$8,000 to 8,999
5.2	$9,000 to 9,999
7.4	$10,000 to 10,999
0	$11,000 to 11,999
0.7	$12,000 to 12,999
0	$13,000 to 13,999
0	$14,000 to 14,999
8.1	$15,000 or more

15. Distance from facility/activity (median)

35	miles from home
40	miles from work

One-way commuting time to facility/activity (median)

60	minutes from home
60	minutes from work

16. AFTP facility different from UTA/MUTA facility? (percent)

5.1	Yes
94.9	No

17. Required to participate in SFTS program? (percent)

47.8	Yes
52.2	No

Number of hours spent annually in SFTS program (median)

12	hours

Distance to SFTS site (median)

50	miles from home
45	miles from work

Summary of Demographic/Background Information: **Total Sample (N=139)**

Commuting time to SFTS site (median)

80 minutes from home
80 minutes from work

Number of single AFTPs attended in last fiscal year (median)

20 single AFTPs

19. Agreement that number of single AFTPs is sufficient (mean/std dev)

3.1 / 1.5, 1 = Very strongly disagree, 7 = Very strongly agree

20. Number of dual AFTPs attended in last fiscal year (median)

2 dual AFTPs

21. Agreement that number of dual AFTPs is sufficient (mean/std dev)

2.9 / 1.5, 1 = Very strongly disagree, 7 = Very strongly agree

22. Availability of resources during evening or weekend AFTPs (mean/std dev)

3.8 / 1.4, 1 = Almost never available, 7 = Almost always available

76.7 Percent stating Instructor Pilots not available
45 Percent stating Aircraft not available
61.7 Percent stating Support Personnel not available

23. Number of AFTPs with IP (median)

3 AFTPs

24. Number of additional paid hours available each month to meet requirements (median)

5 hours

25. Additional single AFTPs required per year (median)

10 AFTPs

26. TOE, MTOE, TDA duty position (percent)

3	Company/Troop Commander
3.8	Flight Safety Technician
0	Executive Officer
5.3	Operations Officer
7.5	Staff Aviation Officer
1.5	Flight Operations Officer
4.5	Instrument Examiner
1.5	Platoon Leader/Commander
7.5	Section Leader/Commander
0.8	Team Leader
7.5	Instructor Pilot
7.5	Observation Helicopter Pilot (OH-58)
36.8	Utility Helicopter Pilot (UH-1)
5.3	Cargo Helicopter Pilot (CH-47)
2.3	Utility Airplane Pilot
2.3	Maintenance Test Pilot
0	Aircraft Maintenance Technician
3	Other

28. Source of entry into Army Reserve (percent)

16.2	Civilian - no prior service
17.6	Civilian - prior military service
31.6	Direct from active Army
3.7	Direct from active duty - other military service
13.2	Direct from Army National Guard
4.4	Direct from active reserve - other military service
11	Direct from Individual Ready Reserve
2.2	Other

29. Received IERW flight training at Fort Rucker after joining Army? (percent)

35	Yes
65	No

30. Years/months in current USAR unit (median)

2 years 10 months

31. Years/months of total military service (median)

11 years 4.5 months

Summary of Demographic/Background Information: **Total Sample (N=139)**

32. **Years/months in active component (median)**

4 years 0 months

Years/months in Army Reserve

5 years 11.5 months

Years/months in other active reserve

Insufficient Data

33. **Years/months on military flight orders (median)**

8 years 1 months

34. **Currently taking a military correspondence course? (percent)**

25.8 Yes
76.2 No

35. **Expect to take military course in next year? (percent)**

53.8 Yes
26.9 No
19.2 Undecided

(QUESTIONS 36 - 39 PERTAIN TO WARRANT OFFICERS ONLY)

36. **WO grade (percent)**

31.7 WO1
23.3 CW2
12.9 CW3
31.7 CW4

37. **Primary Military Occupational Specialty (PMOS) (percent)**

1 100A - Multiengine Utility Helicopter Pilot
0 100BH - Aeroscout Pilot
80 100B - Utility/Observation Helicopter Pilot
13 100C - Cargo Helicopter Pilot
0 100D - Heavy Lift Helicopter Pilot
6 100Q - Combat Service/Support Fixed Wing Pilot

38. Previously a commissioned officer on Active Duty? (percent)

14.4	Yes
85.6	No

Previously a commissioned officer in Army Reserve? (percent)

10.9	Yes
89.1	No

39. Highest military education level (percent)

68.4	Warrant Officer Candidate Development
13.7	Advanced Course
10.5	Senior Course
7.4	Other

(ITEMS 40 - 43 PERTAIN TO COMMISSIONED OFFICERS ONLY)

40. Current commissioned officer grade (percent)

14.3	Second Lieutenant
17.1	First Lieutenant
31.4	Captain
28.6	Major
8.6	Lieutenant Colonel
0	Colonel

41. Current branch of service (percent)

91.4	Aviation
8.6	Transportation Corps

42. Speciality skill identifier (SSI) (percent)

85.7	15A - General Aviation
2.9	15B - Combat Aviation
2.9	15C - Combat support Aviation
2.9	15T - Aviation Logistics
5.7	67J - Aeromedical Evacuation

43. Highest military education level (percent)

42.9	Basic Course
37.1	Advanced Course
20	Command and General Staff

C. Civilian Employment

44. Present employment status (percent)

78.7	Employed full time
5.9	Self-employed
4.4	Employed part time
7.4	Full-time student
3.7	Unemployed

45. Professional civilian pilot? (percent)

35.3	Yes
64.7	No

Full-time USAR technician? (percent)

15.1	Yes
84.9	No

Active duty with Army Guard and Reserve (AGR)? (percent)

5	Yes
95	No

46. Current projected annual income from civilian job (percent)

0.8	Less than $5,000
1.7	$5,000 - 9,999
5.9	$10,000-14,999
5.1	$15,000-19,999
9.3	$20,000-24,999
9.3	$25,000-29,999
20.3	$30,000-34,999
14.4	$35,000-39,999
9.3	$40,000-44,999
5.9	$45,000-49,999
8.5	$50,000-59,000
9.3	$60,000 or above

47 Total income from all sources (percent)

0.8	Less than $5,000
1.7	$5,000 - 9,999
2.5	$10,000-14,999
5.9	$15,000-19,999
5	$20,000-24,999
6.7	$25,000-29,999
10.9	$30,000-34,999
9.2	$35,000-39,999
16	$40,000-44,999
10.9	$45,000-49,999
14.3	$50,000-59,000
16	$60,000 or above

48. Company's official leave policy (percent)

45	two weeks leave with full pay
20	two weeks leave, pays difference between salary and USAR pay
1.7	use of vacation time required
20	two weeks leave without pay
8.3	Not applicable - self employed
5	other

49. Civilian job supervisor's attitude toward USAR career (mean/std dev)

4.7 / 1.8, 1 = Very negative, 7 = Very positive

50. Hours per week on civilian job (median)

50 hours

51. Does civilian job require overnight travel? (percent)

45 Yes
55 No

Number of nights away from home per month (median)

3.5 nights per month

52. Effect of civilian job on ability to attend UTAs/MUTAs (mean/std dev)

2.9 / 1.8, 1 = Very easy to get time off, 7 = Very hard to get time off

53. Effect of civilian job on ability to attend AFTPs (mean/std dev)

3.7 / 2.0, 1 = Very easy to get time off, 7 = Very hard to get time off

54. Effect of civilian job on ability to attend ADT (mean/std dev)

4.3 / 2.0, 1 = Very easy to get time off, 7 = Very hard to get time off

55. Effect of civilian job on ability to attend Annual Training (mean/std dev)

3 / 1.7, 1 = Very easy to get time off, 7 = Very hard to get time off

(QUESTIONS 56 - 68 PERTAIN TO CIVILIAN JOB SATISFACTION AND ARE SUMMARIZED BELOW)

Satisfaction with civilian job security (mean/std dev)

5.1 / 1.5, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job pay (mean/std dev)

4.7 / 1.5, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with social aspects of civilian job (mean/std dev)

5.4 / 1.1, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job supervisor (mean/std dev)

4.9 / 1.3, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with growth opportunities in civilian job (mean/std dev)

5.2 / 1.4, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job in general (mean/std dev)

4.8 / 1.6, 1 = Extremely dissatisfied, 7 = Extremely satisfied

D. Family

71. Is spouse employed? (percent of married aviators)

39.3 Yes - full time
20.2 Yes - part time
7.9 Self-employed
3.3 Full-time student
29.2 No

73. Spouse's annual income (percent)

15	Less than $5,000
16.7	$5,000 - 9,999
11.7	$10,000-14,999
18.3	$15,000-19,999
16.7	$20,000-24,999
6.7	$25,000-29,999
5	$30,000-34,999
1.7	$35,000-39,999
1.7	$40,000-44,999
1.7	$45,000-49,999
5	$50,000 or above

74. Spouse's attitude toward USAR (mean/std dev)

4.7 / 1.6, 1 = Very negative, 7 = Very positive

Children's attitude toward USAR (mean/std dev)

4.9 / 1.4, 1 = Very negative, 7 = Very positive

75. Spouse's influence on USAR career intentions (mean/std dev)

4.6 / 1.4, 1 - Great influence to leave, 7 = Great influence to stay

Children's influence on USAR career intentions (mean/std dev)

4.4 / 1.3, 1 - Great influence to leave, 7 = Great influence to stay

PART III: ARMY RESERVE CAREER INTENTIONS

A. USAR Career Intentions

1. USAR career intentions (percent)

48.9	Stay for 30-year retirement eligibility
36.5	Stay for 20-year retirement elibigility
5.1	Stay in for at least one year but less than 20
2.9	Get out within next the year
6.6	Other

2. Intend to leave USAR before retirement eligibility to transfer to ARNG? (percent)

5.5	Yes
94.5	No

Summary of Demographic/Background Information: Total Sample (N=139)

Intend to leave USAR before retirement eligibility to go on active duty? (percent)

14.3 Yes
85.7 No

3. How often think about leaving USAR? (mean/std dev)

3 / 1.6 1 = Almost never, 7 = Almost always

4. Likelihood of seeking part-time job other than USAR? (mean/std dev)

3 / 1.9, 1 = Extremely unlikely, 7 = Extremely likely

5. Chances of finding alternative part-time job? (mean/std dev)

3.5 / 2.1, 1 = Chances extremely poor, 7 = Chances extremely good

B. Influences on USAR Career Intentions

6. Reasons for joining the USAR (percent)

80.6 Opportunity to fly
53.2 Pay
42.4 Time invested toward military retirement
33.1 Patriotism/national pride
22.3 Association with other aviators
14.4 Opportunity to improve flying skills
5 Job requirement as USAR technician
2.9 Other
0.7 Satisfy military obligation

7. Reasons for remaining in USAR (percent)

71.9 Opportunity to fly
61.9 Pay
58.3 Retirement benefits
29.3 Association with other aviators
21.6 Patriotism/national pride
12.9 Maintain flying proficiency
12.9 Change of pace from civilian job
9.4 Job requirement as USAR technician
1.4 Other

8. Reasons for possible leaving USAR (percent)

55.4 Administrative details/politics
43.9 Unrealistic training goals for time/resources available
43.2 Loss of flight status
34.5 Lack of adequate support personnel/equipment
34.5 Decreasing opportunity to fly
29.5 Excessive additional nonflying duties
26.6 Insufficient time allocated to maintain a safe level of proficiency
25.9 Conflict with civilian job
22.3 Conflict with family interests
19.4 Increase in training requirements
18.7 Lack of competence in aviation matters by chain of command
18.7 Lack of opportunity to schedule dual AFTPs
17.3 Unequal flight pay (USAR vs Active Component)
12.2 Lack of concern and/or respect for the individual
11.5 Lack of promotion opportunity
10.8 Policies concerning retirement points for AFTPs
9.4 Travel time and cost incurred to attend USAR training
7.9 Other
0.7 Requirement to mobilize

C. Satisfaction With the USAR

(QUESTIONS 9 - 23 PERTAIN TO USAR JOB SATISFACTION AND ARE SUMMARIZED BELOW)

Satisfaction with USAR job security (mean/std dev)

4.7 / 1.5, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR job pay

4.6 / 1.3, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with social aspects of USAR job (mean/std dev)

5.2 / 1.0, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR supervisor (mean/std dev)

4.9 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Summary of Demographic/Background Information: Total Sample (N=139)

Satisfaction with growth opportunities in USAR job (mean/std dev)

5 / 1.0, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR job in general (mean/std dev)

5.1 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

DATA SUMMARY FOR COMMISSIONED OFFICERS

(n = 35)

Summary of Requirements Ratings: Commissioned Officers (n=35)

PART I: TRAINING REQUIREMENTS

A. Ratings of the Adequacy of the Training Requirements For Maintaining a Safe Level of Proficiency

Qualification Requirements	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	60	3.6	0.9
Unaided Night Tactical Flight	51	2.7	1.3
Night Vision Goggles	29	2	1.3
Nuclear, Biological, Chemical Flight	46	2.9	1.2
Other Tasks	14	4.2	1.1
Transition Training Requirements			
Alternate/Additional Aircraft	49	4.5	1.5
Continuation Training Requirements			
Emergency Tasks	94	3.5	1.4
Emergency Procedures	91	3.8	1.4
Instrument Tasks	94	4	1.2
Terrain Flight (NOE) Tasks	91	2.9	1.1
Unaided Night Tactical Tasks	80	2.7	1.1
Night Vision Goggle (NVG) Tasks	37	1.7	0.9
Tactical/Special Tasks	74	3.5	1.1
Mission Tasks	94	4	1
Additional Tasks	86	3.8	1.1
Other Tasks	14	3.2	1.1
Additional Military Requirements			
Inflight Evaluation/Training of Aviators	54	4.2	0.7
Pre- and Postflight Tasks	94	4.4	1.3
Training in Aviation Academic Subjects	94	3.6	1.3
Nonflying Aviation Evaluations	94	3.8	1.2
Military Education Requirements	91	3.3	1.5
Preparation for Inspections	91	3.5	1.6

*Scale anchors:

1 = Much less than adequate for a safe level of proficiency

7 = Much more than adequate for a safe level of proficiency

B. Ratings of the Adequacy of the Time Allocated For Meeting the Training Requirements

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	60	2.9	1.2
Unaided Night Tactical Flight	51	2.6	1.1
Night Vision Goggles	29	1.6	1.1
Nuclear, Biological, Chemical Flight	51	2.7	1.4
Other Tasks	9	2.3	1.5

Transition Training Requirements

Alternate/Additional Aircraft	46	3.8	0.9

Continuation Training Requirements

Emergency Tasks	94	3.2	1.3
Emergency Procedures	97	3.5	1.1
Instrument Tasks	91	3.8	1
Terrain Flight (NOE) Tasks	91	2.8	1.3
Unaided Night Tactical Tasks	83	2.9	1.3
Night Vision Goggle (NVG) Tasks	43	1.9	1.3
Tactical/Special Tasks	83	3.3	1
Mission Tasks	94	3.9	0.8
Additional Tasks	89	3.6	1.1
Other Tasks	14	3.6	0.9

Additional Military Requirements

Inflight Evaluation/Training of Aviators	66	3.7	1.2
Pre- and Postflight Tasks	97	4.1	1.1
Training in Aviation Academic Subjects	97	3.5	1.1
Nonflying Aviation Evaluations	97	3.6	1
Military Education Requirements	94	3.3	1.4
Preparation for Inspections	91	3.5	1.4

*Scale anchors:
1 = Too little time is allocated to the task
7 = Too much time is allocated to the task

Summary of Requirements Ratings: Commissioned Officers (n=35)

C. Ratings of the Willingness to Spend Additional Paid Time To Meet the Training Requirements

Qualification Requirements	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	63	5.5	1.4
Unaided Night Tactical Flight	66	5.2	1.5
Night Vision Goggles	54	5.1	2
Nuclear, Biological, Chemical Flight	63	4.6	1.8
Other Tasks	37	5.3	1.8
Transition Training Requirements			
Alternate/Additional Aircraft	69	5.6	1.6
Continuation Training Requirements			
Emergency Tasks	97	5.1	1.9
Emergency Procedures	97	4.9	1.9
Instrument Tasks	97	4.9	1.8
Terrain Flight (NOE) Tasks	94	4.8	2
Unaided Night Tactical Tasks	91	4.6	1.9
Night Vision Goggle (NVG) Tasks	71	4.8	2.1
Tactical/Special Tasks	91	4.8	1.8
Mission Tasks	94	4.9	1.9
Additional Tasks	89	4.9	1.8
Other Tasks	34	4.8	2.2
Additional Military Requirements			
Inflight Evaluation/Training of Aviators	57	4.7	1.8
Pre- and Postflight Tasks	97	4.4	1.9
Training in Aviation Academic Subjects	97	4.7	1.8
Nonflying Aviation Evaluations	97	4.8	1.7
Military Education Requirements	97	4.4	1.9
Career Development	97	5	1.8
Additional Nonflying Duties	97	4.6	1.9
Preparation for Inspections	94	4.6	1.7

*Scale anchors:
1 = Very unwilling to spend additional paid training time
7 = Very willing to spend additional paid training time

D. Ratings of the Willingness to Spend Additional Nonpay Status Time To Meet the Training Requirements

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	69	3	1.8
Unaided Night Tactical Flight	66	2.7	1.8
Night Vision Goggles	49	3.5	2
Nuclear, Biological, Chemical Flight	60	2.7	1.7
Other Tasks	26	2.9	1.5

Transition Training Requirements

Alternate/Additional Aircraft	69	3.1	2

Continuation Training Requirements

Emergency Tasks	97	2.5	1.9
Emergency Procedures	97	2.5	1.9
Instrument Tasks	97	2.6	1.9
Terrain Flight (NOE) Tasks	97	2.5	1.9
Unaided Night Tactical Tasks	91	2.6	1.9
Night Vision Goggle (NVG) Tasks	63	3	2
Tactical/Special Tasks	89	2.6	1.9
Mission Tasks	94	2.5	1.8
Additional Tasks	89	2.6	1.9
Other Tasks	37	2.6	1.6

Additional Military Requirements

Inflight Evaluation/Training of Aviators	71	2.5	1.9
Pre- and Postflight Tasks	97	2.3	1.8
Training in Aviation Academic Subjects	97	2.6	1.8
Nonflying Aviation Evaluations	97	2.3	1.6
Military Education Requirements	97	2.3	1.6
Career Development	97	3.1	2
Additional Nonflying Duties	97	2.7	1.8
Preparation for Inspections	91	2.6	1.8

*Scale anchors:

1 = Very unwilling to spend additional nonpay status training time

7 = Very willing to spend additional nonpay status training time

E. Percent of the Aviators Identifying Characteristics of the Training Environment as Obstacles to Training

Qualification Requirements	Percent Applicable	Percent Identifying Characteristic as Obstacle to Training: IPS	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
Terrain (NOE) Flight	74	32	14	27	27	41	55	18	14	23
Unaided Night Tactical Flight	54	24	14	29	29	43	38	14	10	33
Night Vision Goggles	46	39	23	23	69	54	39	23	8	23
Nuclear, Biological, Chemical Flight	64	24	18	12	59	35	18	12	12	18
Other Tasks	35	29	43	29	14	71	0	0	14	14
Transition Training Requirements										
Alternate/Additional Aircraft	45	40	7	53	7	27	7	27	33	40
Continuation Training Requirements										
Emergency Tasks	91	50	13	29	8	29	0	29	33	29
Emergency Procedures	86	36	14	14	27	23	9	18	32	36
Instrument Tasks	89	44	4	48	17	30	9	17	26	22
Terrain Flight (NOE) Tasks	88	33	11	22	15	26	52	26	33	26
Unaided Night Tactical Tasks	74	30	13	30	22	35	30	26	22	22
Night Vision Goggle (NVG) Tasks	49	53	27	47	73	40	33	20	13	20
Tactical/Special Tasks	81	45	15	40	10	30	20	25	25	30
Mission Tasks	83	50	15	45	10	35	10	35	25	30
Additional Tasks	78	42	5	37	5	32	5	32	26	32
Other Tasks	35	40	20	20	20	40	0	20	40	60
Additional Military Requirements										
Inflight Evaluation/Training of Aviators	60	36	14	21	21	36	0	14	21	21
Non-Training Flights	82	15	25	25	15	20	0	25	20	40
Pre- and Postflight Tasks	78	16	21	16	21	16	0	11	26	42
Nonflying Aviation Evaluations	82	32	11	11	11	21	0	5	26	63
Military Education Requirements	82	19	19	10	14	14	5	5	29	62
Career Development	82	15	15	5	10	15	5	0	25	70
Additional Nonflying Duties	84	10	14	5	14	10	0	0	29	76
Preparation for Inspections	83	10	10	5	5	10	10	0	15	75

PART II: BACKGROUND INFORMATION

A. Personal Characteristics

1. Age (median)

35	Years

2. Sex (percent)

2.9	Female
97.1	Male

3. Ethnic group (percent)

0	American Indian
0	Asian
0	Black
97.1	Caucasian
0	Hispanic
2.9	Other

4. Marital status (percent)

22.9	Single - never married
51.4	Married - never divorced
5.7	Married - previously divorced
8.6	Divorced - not remaried
11.4	Separated
0	Widow/Widower

5. Number of children at home (median)

2	Children

6. Highest civilian education (percent)

0	Some high school
2.9	High School grad/GED
0	Trade or tech school
8.6	Some college (no degree)
5.7	Associate degree
51.4	Bachelors degree
25.7	Masters degree
0	Ph.D. Degree
5.7	Other professional degree

7. Hours in community activities (median)

7	hours per week

B. Military Characteristics

9. Primary aircraft - rotary wing (percent, median)

62.9	UH-1H	1100	Hours
2.9	UH-1V	-	Hours
0	UH-60	-	Hours
0	EH-1H	-	Hours
17.1	OH-58	300	Hours
5.7	CH-47	-	Hours
0	Other	-	Hours

Primary aircraft - fixed wing (percent)

0	T-42	-	Hours
0	U-3	-	Hours
2.9	U-8	-	Hours
5.7	U-21	-	Hours
2.9	Other	-	Hours

10. Current in other types of aircraft? (percent)

31.4	Yes
68.6	No

11. Total military flight hours (median)

1001 Hours

Civilian flight hours in military aircraft (median)

1000 Hours

Civilian flight hours in civilian aircraft (median)

450 Hours

Logged combat flight hours? (percent)

31	Yes
69	No

Combat flight hours (median of aviators with combat experience)

986 Hours

Summary of Demographic/Background Information: Commissioned Officers (n=35)

12. Highest qualifications (percent)

	n	Pilot	UT	IP	SIP
UH-1H	**25**	80	4	8	8
UH-1V	**4**	100	0	0	0
UH-60	**1**	100	0	0	0
EH-1H	**0**	0	0	0	0
OH-58	**8**	100	0	0	0
CH-47	**2**	100	0	0	0
Other	**3**	0	0	0	0
T-42	**2**	50	0	0	50
U-3	**0**	0	0	0	0
U-8	**5**	40	0	20	40
U-21	**4**	75	0	25	0
Other	**2**	100	0	0	0

13. Aviation qualifications (percent)

91.4	Instrument Ticket
71.4	Terrain Flight (NOE)
37.1	Unaided Night Tactical
17.1	Night Vision Goggles
14.3	Safety Officer
14.3	Maintenance Officer
8.6	Maintenance Test Pilot
0	Rotary Wing Instrument Flight Examiner
0	Fixed Wing Instrument Flight Examiner
0	Maintenance Test Flight Examiner
5.7	Other

14. Income from USAR job (percent)

0	Less than $ 1,000
0	$1,000 to 1,999
0	$2,000 to 2,999
3	$3,000 to 3,999
9.1	$4,000 to 4,999
9.1	$5,000 to 5,999
15.2	$6,000 to 6,999
18.2	$7,000 to 7,999
12.1	$8,000 to 8,999
6.1	$9,000 to 9,999
12.1	$10,000 to 10,999
0	$11,000 to 11,999
3	$12,000 to 12,999
0	$13,000 to 13,999
0	$14,000 to 14,999
12.1	$15,000 or more

Summary of Demographic/Background Information: **Commissioned Officers (n=35)**

15. Distance from facility/activity (median)

33 miles from home
37.5 miles from work

One way commuting time to facility/activity (median)

55 minutes from home
60 minutes from work

16. AFTP facility different from UTA/MUTA facility? (percent)

11.4 Yes
88.6 No

17. Required to participate in SFTS program? (percent)

54.5 Yes
45.5 No

Number of hours spent annually in SFTS program (median)

12 hours

Distance to SFTS site (median)

45 miles from home
49 miles from work

Commuting time to SFTS site (median)

77.5 minutes from home
67.5 minutes from work

Number of single AFTPs attended in last fiscal year (median)

16 single AFTPs

19. Agreement that number of single AFTPs is sufficient (mean/std dev)

3.3 / 1.5, 1 = Very strongly disagree, 7 = Very strongly agree

20. Number of dual AFTPs attended in last fiscal year (median)

0.5 dual AFTPs

21. Agreement that number of dual AFTPs is sufficient (mean/std dev)

3.3 / 1.5, 1 = Very strongly disagree, 7 = Very strongly agree

Summary of Demographic/Background Information: Commissioned Officers (n=35)

22. Availability of resources during evening or weekend AFTPs (mean/std dev)

4.1 / 1.4, 1 = Almost never available, 7 = Almost always available

Type of resource not available during evening or weekend AFTPs (percent)

63.6 Instructor Pilots
54.5 Aircraft
72.7 Support Personnel

23. Number of AFTPs with IP (median)

2 AFTPs

24. Number of additional paid hours available each month to meet requirements (median)

7 hours

25. Additional single AFTPs required per year (median)

6 AFTPs

26. TOE, MTOE, TDA duty position (percent)

8.8 Company/Troop Commander
0 Flight Safety Technician
0 Executive Officer
17.6 Operations Officer
29.4 Staff Aviation Officer
2.9 Flight Operations Officer
0 Instrument Examiner
5.9 Platoon Leader/Commander
20.6 Section Leader/Commander
2.9 Team Leader
0 Instructor Pilot
2.9 Observation Helicopter Pilot (OH-58)
2.9 Utility Helicopter Pilot (UH-1)
0 Cargo Helicopter Pilot (CH-47)
0 Utility Airplane Pilot
2.9 Maintenance Test Pilot
0 Aircraft Maintenance Technician
2.9 Other

Summary of Demographic/Background Information: **Commissioned Officers (n=35)**

28. Source of entry into Army Reserve (percent)

5.9	Civilian - no prior service
11.8	Civilian - prior military service
44.1	Direct from active Army
0	Direct from active duty - other military service
14.7	Direct from Army National Guard
2.9	Direct from active reserve - other military service
11.8	Direct from Individual Ready Reserve
8.8	Other

29. Received IERW flight training at Fort Rucker after joining Army? (percent)

34.3	Yes
65.7	No

30. Years/months in current USAR unit (median)

1 years 10 months

31. Years/months of total military service (median)

11 years 10.5 months

32. Years/months in active component (median)

6 years 6.5 months

Years/months in Army Reserve (median)

5 years 6 months

Years/months in other active reserve (median)

Insufficient Data

33. Years/months on military flight orders (median)

9 years 0 months

34. Currently taking a military correspondence course? (percent)

32.4	Yes
67.6	No

35. Expect to take military course in next year? (percent)

57.6	Yes
36.4	No
6.1	Undecided

40. Current commissioned officer grade (percent)

14.3	Second Lieutenant
17.1	First Lieutenant
31.4	Captain
28.6	Major
8.6	Lieutenant Colonel
0	Colonel

41. Current branch of service (percent)

91.4	Aviation
8.6	Transportation Corps

42. Speciality Skill Identifier (SSI) (percent)

85.7	15A - General Aviation
2.9	15B - Combat Aviation
2.9	15C - Combat support Aviation
2.9	15T - Aviation Logistics
5.7	67J - Aeromedical Evacuation

43. Highest military education level (percent)

42.9	Officer Basic Course
37.1	Officer Advanced Course
20	Command and General Staff

D. Civilian Employment

44. Present employment status (percent)

84.8	Employed full time
9.1	Self-employed
0	Employed part time
0	Full-time student
6.1	Unemployed

45. Professional civilian pilot? (percent)

26.7	Yes
73.3	No

Full-time USAR technician? (percent)

13.3	Yes
86.7	No

Active duty with Army Guard and Reserve (AGR)? **(percent)**

9.7	Yes
90.3	No

46. Current projected annual income from civilian job (percent)

0	Less than $ 5,000
0	$5,000 - 9,999
0	$10,000 - 14,999
0	$15,000 - 19,999
10	$20,000 - 24,999
6.7	$25,000 - 29,999
23.3	$30,000 - 34,999
20	$35,000 - 39,999
13.3	$40,000 - 44,999
3.3	$45,000 - 49,999
6.7	$50,000 - 59,000
16.7	$60,000 or above

47. Total income from all sources (percent)

0	Less than $ 5,000
0	$5,000 - 9,999
0	$10,000 - 14,999
0	$15,000 - 19,999
6.5	$20,000 - 24,999
3.2	$25,000 - 29,999
9.7	$30,000 - 34,999
12.9	$35,000 - 39,999
16.1	$40,000 - 44,999
12.9	$45,000 - 49,999
22.6	$50,000 - 59,000
16.1	$60,000 or above

48. Company's official leave policy (percent)

29	two weeks leave with full pay
25.8	two weeks leave, pays difference between salary and USAR pay
0	use of vacation time required
19.4	two weeks leave without pay
16.1	Not applicable - self employed
9.7	other

49. Civilian job supervisor's attitude toward USAR career (mean/std dev)

4.9 / 1.7, 1 = Very negative, 7 = Very positive

50. Hours per week on civilian job (median)

53 hours

51. Does civilian job require overnight travel? (percent)

53.3 Yes
46.7 No

Number of nights away from home per month (median)

3 nights per month

52. Effect of civilian job on ability to attend UTAs/MUTAs (mean/std dev)

3.2 / 2.0, 1 = Very easy to get time off, 7 = Very hard to get time off

53. Effect of civilian job on ability to attend AFTPs (mean/std dev)

4.4 / 2.1, 1 = Very easy to get time off, 7 = Very hard to get time off

54. Effect of civilian job on ability to attend ADT (mean/std dev)

4.9 / 2.0, 1 = Very easy to get time off, 7 = Very hard to get time off

55. Effect of civilian job on ability to attend Annual Training (mean/std dev)

3.2 / 1.7, 1 = Very easy to get time off, 7 = Very hard to get time off

(Questions 56 - 69 Pertain to Civilian Job Satisfaction And Are Summarized Below)

Satisfaction with civilian job security (mean/std dev)

5.3 / 1.7, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job pay (mean/std dev)

5 / 1.6, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with social aspects of civilian job (mean/std dev)

5.6 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job supervisor (mean/std dev)

5.1 / 1.6, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with growth opportunities in civilian job (mean/std dev)

5.4 / 1.6, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job in general (mean/std dev)

5 / 2.0, 1 = Extremely dissatisfied, 7 = Extremely satisfied

D. Family

71. Is spouse employed? (percent of married aviators)

47.6	Yes - full time
19	Yes - part time
4.8	Self-employed
9.5	Full-time student
19	No

73. Spouse's annual income (percent)

13.3	Less than $ 5,000
20	$5,000 - 9,999
6.7	$10,000 - 14,999
26.7	$15,000 - 19,999
6.7	$20,000 - 24,999
6.7	$25,000 - 29,999
6.7	$30,000 - 34,999
0	$35,000 - 39,999
0	$40,000 - 44,999
6.7	$45,000 - 49,999
6.7	$50,000 or above

74. Spouse's attitude toward USAR (mean/std dev)

5 / 1.7, 1 = Very negative, 7 = Very positive

Children's attitude toward USAR (mean/std dev)

4.8 / 1.7, 1 = Very negative, 7 = Very positive

75. Spouse's influence on USAR career intentions (mean/std dev)

4.6 / 1.4, 1 - Great influence to leave, 7 = Great influence to stay

Children's influence on USAR career intentions (mean/std dev)

4.2 / 1.6, 1 - Great influence to leave, 7 = Great influence to stay

PART III: ARMY RESERVE CAREER INTENTIONS

A. 1. USAR career intentions (percent)

51.4	Stay for 30-year retirement eligibility
40	Stay for 20-year retirement elibigility
5.7	Stay in for at least one year but less than 20
0	Get out within next the year
2.9	Other

2. Intend to leave USAR before retirement eligibility to transfer to ARNG? (percent)

0	Yes
100	No

Intend to leave USAR before retirement eligibility to go on active duty? (percent)

13.3	Yes
86.7	No

3. How often think about leaving USAR? (mean/std dev)

3 / 1.9, 1 = Almost never, 7 = Almost always

4. Likelihood of seeking part-time job other than USAR? (mean/std dev)

2 / 1.6, 1 = Extremely unlikely, 7 = Extremely likely

5. Chances of finding alternative part-time job? (mean/std dev)

3.2 / 2.2, 1 = Chances extremely poor, 7 = Chances extremely good

B. Influences on USAR Career Intentions

6. Reasons for joining the USAR (percent)

74.3	Opportunity to fly
54.3	Pay
54.3	Time invested toward military retirement
31.4	Patriotism/national pride
17.1	Association with other aviators
8.6	Job requirement as USAR technician
5.7	Opportunity to improve flying skills
5.7	Other
0	Satisfy military obligation

7. Reasons for remaining in USAR (percent)

77.1	Opportunity to fly
62.9	Pay
57.1	Retirement benefits
20	Patriotism/national pride
20	Change of pace from civilian job
14.3	Association with other aviators
11.4	Maintain flying proficiency
8.6	Job requirement as USAR technician
5.7	Other

8. Reasons for possible leaving USAR (percent)

42.9	Unrealistic training goals for time/resources available
37.1	Administrative details/politics
34.3	Lack of adequate support personnel/equipment
31.4	Conflict with civilian job
31.4	Loss of flight status
28.6	Excessive additional nonflying duties
25.7	Conflict with family interests
25.7	Travel time and cost incurred to attend USAR training
22.9	Lack of opportunity to schedule dual AFTPs
20	Lack of competence in aviation matters by chain of command
20	Decreasing opportunity to fly
17.1	Lack of promotion opportunity
17.1	Unequal flight pay (USAR vs Active Component)
17.1	Increase in training requirements
14.3	Insufficient time allocated to maintain a safe level of proficiency
11.4	Lack of concern and/or respect for the individual
11.4	Policies concerning retirement points for AFTPs
8.6	Other
0	Requirement to mobilize

C. Satisfaction With the USAR

(Questions 9 - 23 Pertain to USAR Job Satisfaction And Are Summarized Below)

Satisfaction with USAR job security (mean/std dev)

4.8 / 1.3, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR job pay (mean/std dev)

5.1 / 1.6, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with social aspects of USAR job (mean/std dev)

5.5 / 1.0, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR supervisor (mean/std dev)

5 / 1.6, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with growth opportunities in USAR job (mean/std dev)

5.2 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR job in general (mean/std dev)

5.3 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

DATA SUMMARY FOR WARRANT OFFICERS

(n = 104)

Summary of Requirements Ratings: Warrant Officers (n=104)

PART I: TRAINING REQUIREMENTS

A. Ratings of the Adequacy of the Training Requirements For Maintaining a Safe Level of Proficiency

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	78	3.6	1.6
Unaided Night Tactical Flight	65	3.4	1.5
Night Vision Goggles	37	2.5	1.6
Nuclear, Biological, Chemical Flight	70	2.9	1.5
Other Tasks	24	3.5	1.7

Transition Training Requirements

Alternate/Additional Aircraft	41	4.1	1.1

Continuation Training Requirements

Emergency Tasks	94	3.7	1.5
Emergency Procedures	92	4.1	1.2
Instrument Tasks	94	4	1.2
Terrain Flight (NOE) Tasks	87	3.4	1.5
Unaided Night Tactical Tasks	70	3.4	1.4
Night Vision Goggle (NVG) Tasks	31	2.1	1.4
Tactical/Special Tasks	78	3.3	1.7
Mission Tasks	91	4.1	1.4
Additional Tasks	82	3.9	1.3
Other Tasks	11	3.2	1

Additional Military Requirements

Inflight Evaluation/Training of Aviators	65	4.2	1.2
Pre- and Postflight Tasks	98	4.6	1.3
Training in Aviation Academic Subjects	97	3.7	1.3
Nonflying Aviation Evaluations	97	4.1	1.3
Military Education Requirements	93	3.6	1.4
Preparation for Inspections	90	4	1.6

*Scale anchors:
1 = Much less than adequate for a safe level of proficiency
7 = Much more than adequate for a safe level of proficiency

B. Ratings of the Adequacy of the Time Allocated For Meeting the Training Requirements

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	78	2.8	1.2
Unaided Night Tactical Flight	67	2.7	1.1
Night Vision Goggles	29	2.2	1.2
Nuclear, Biological, Chemical Flight	66	2.9	1.2
Other Tasks	15	3.3	1

Transition Training Requirements

Alternate/Additional Aircraft	43	3.4	1.2

Continuation Training Requirements

Emergency Tasks	93	3.1	1.1
Emergency Procedures	91	3.5	1
Instrument Tasks	94	3.4	1.2
Terrain Flight (NOE) Tasks	88	2.9	1.2
Unaided Night Tactical Tasks	71	3	1.2
Night Vision Goggle (NVG) Tasks	30	2	1.2
Tactical/Special Tasks	80	3.1	1.1
Mission Tasks	90	3.5	1.1
Additional Tasks	81	3.5	1.1
Other Tasks	12	3.6	1.6

Additional Military Requirements

Inflight Evaluation/Training of Aviators	64	3.5	1
Pre- and Postflight Tasks	95	3.9	1.2
Training in Aviation Academic Subjects	96	3.2	1.1
Nonflying Aviation Evaluations	97	3.5	1.1
Military Education Requirements	92	3.3	1.2
Preparation for Inspections	88	3.6	1.7

*Scale anchors:
1 = Too little time is allocated to the task
7 = Too much time is allocated to the task

C. Ratings of the Willingness to Spend Additional Paid Time To Meet the Training Requirements

Qualification Requirements

	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	81	5.5	1.6
Unaided Night Tactical Flight	73	5.5	1.6
Night Vision Goggles	60	5.2	1.9
Nuclear, Biological, Chemical Flight	77	4.5	1.8
Other Tasks	29	4.9	2.3

Transition Training Requirements

Alternate/Additional Aircraft	58	5.7	1.5

Continuation Training Requirements

Emergency Tasks	95	5.7	1.3
Emergency Procedures	94	5.5	1.6
Instrument Tasks	94	5.7	1.4
Terrain Flight (NOE) Tasks	91	5.4	1.6
Unaided Night Tactical Tasks	84	5.5	1.6
Night Vision Goggle (NVG) Tasks	65	5.4	1.7
Tactical/Special Tasks	90	5.3	1.6
Mission Tasks	94	5.5	1.5
Additional Tasks	89	5.3	1.6
Other Tasks	25	5.3	2

Additional Military Requirements

Inflight Evaluation/Training of Aviators	70	5.3	1.5
Pre- and Postflight Tasks	98	5	1.6
Training in Aviation Academic Subjects	98	5.2	1.5
Nonflying Aviation Evaluations	98	4.9	1.6
Military Education Requirements	97	4.4	1.7
Career Development	98	5	1.7
Additional Nonflying Duties	98	4.1	2
Preparation for Inspections	94	3.9	1.9

*Scale anchors:
1 = Very unwilling to spend additional paid training time
7 = Very willing to spend additional paid training time

Summary of Requirements Ratings: Warrant Officers (n=104)

D. Ratings of the Willingness to Spend Additional Nonpay Status Time To Meet the Training Requirements

Qualification Requirements	Percent Applicable	Mean*	Std Dev
Terrain (NOE) Flight	84	3.2	2.2
Unaided Night Tactical Flight	75	3.2	2.2
Night Vision Goggles	63	3.3	2.2
Nuclear, Biological, Chemical Flight	81	2.5	1.8
Other Tasks	39	2.9	2.3
Transition Training Requirements			
Alternate/Additional Aircraft	57	3.3	2.4
Continuation Training Requirements			
Emergency Tasks	97	3.4	2.2
Emergency Procedures	97	3.2	2.1
Instrument Tasks	95	3.3	2.2
Terrain Flight (NOE) Tasks	94	3.2	2.3
Unaided Night Tactical Tasks	84	3.2	2.2
Night Vision Goggle (NVG) Tasks	67	3.3	2.2
Tactical/Special Tasks	92	3	2.1
Mission Tasks	96	3.1	2.2
Additional Tasks	91	3	2.1
Other Tasks	42	2.9	2.3
Additional Military Requirements			
Inflight Evaluation/Training of Aviators	71	2.8	2
Pre- and Postflight Tasks	98	2.9	1.9
Training in Aviation Academic Subjects	98	3	2
Nonflying Aviation Evaluations	98	2.8	1.9
Military Education Requirements	97	2.5	1.7
Career Development	98	2.9	2.1
Additional Nonflying Duties	98	2.2	1.5
Preparation for Inspections	91	2.3	1.5

*Scale anchors:

1 = Very unwilling to spend additional nonpay status training time

7 = Very willing to spend additional nonpay status training time

E. Percent of the Aviators Identifying Characteristics of the Training Environment as Obstacles to Training

Qualification Requirements	Percent Applicable	Percent Identifying Characteristic as Obstacle to Training: IPS	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
Terrain (NOE) Flight	74	38	14	17	16	21	62	30	23	13
Unaided Night Tactical Flight	64	42	15	15	17	31	34	29	24	22
Night Vision Goggles	46	50	13	23	71	19	35	27	15	19
Nuclear, Biological, Chemical Flight	64	30	14	6	41	16	10	21	22	22
Other Tasks	35	38	5	19	29	14	10	29	14	14
Transition Training Requirements										
Alternate/Additional Aircraft	45	55	9	42	24	18	6	27	15	30
Continuation Training Requirements										
Emergency Tasks	91	63	6	24	11	25	8	30	24	18
Emergency Procedures	88	49	11	11	12	18	16	16	22	30
Instrument Tasks	89	54	8	36	21	25	11	25	22	15
Terrain Flight (NOE) Tasks	88	46	12	26	12	22	52	26	22	16
Unaided Night Tactical Tasks	74	40	12	25	17	30	32	30	18	27
Night Vision Goggle (NVG) Tasks	49	55	15	28	60	23	38	28	21	26
Tactical/Special Tasks	81	42	14	25	17	19	29	25	24	14
Mission Tasks	83	35	15	31	24	26	18	21	31	17
Additional Tasks	78	34	17	26	14	25	22	28	31	20
Other Tasks	35	32	16	37	32	32	11	21	21	21
Additional Military Requirements										
Inflight Evaluation/Training of Aviators	60	56	14	20	14	15	7	24	24	24
Non-Training Flights	82	5	12	23	13	15	0	34	20	36
Pre- and Postflight Tasks	78	17	23	6	13	23	4	13	28	32
Nonflying Aviation Evaluations	82	20	15	2	5	22	3	10	23	38
Military Education Requirements	82	10	23	2	10	13	7	7	27	52
Career Development	82	5	14	2	2	11	4	9	25	65
Additional Nonflying Duties	84	3	12	2	5	10	3	8	30	67
Preparation for Inspections	83	4	16	4	7	13	0	5	21	66

Summary of Demographic/Background Information: Warrant Officers (n=104)

PART II: BACKGROUND INFORMATION

A. Personal Characteristics

1. Age (median)

37	Years

2. Sex (percent)

4	Female
96	Male

3. Ethnic group (percent)

1	American Indian
1	Asian
3	Black
95	Caucasian
0	Hispanic
0	Other

4. Marital status (percent)

27.7	Single - never married
51.5	Married - never divorced
12.9	Married - previously divorced
4	Divorced - not remaried
4	Separated
0	Widow/Widower

5. Number of children at home (median)

2	Children

6. Highest civilian education (percent)

0	Some high school
5	High School grad/GED
3	Trade or tech school
45.5	Some college (no degree)
13.8	Associate degree
21.8	Bachelors degree
4	Masters degree
1	Ph.D. Degree
1	Other professional degree

7. Hours in community activities (median)

10	hours per week

B. Military Characteristics

9. Primary aircraft - rotary wing (percent, median)

53.5	UH-1H	505	Hours
18.8	UH-1V	100	Hours
0	UH-60	-	Hours
0	EH-1H	-	Hours
9.9	OH-58	650	Hours
11.9	CH-47	600	Hours
0	Other	-	Hours

Primary aircraft - fixed wing (percent)

0	T-42	-	Hours
0	U-3	-	Hours
1	U-8	-	Hours
5	U-21	-	Hours
0	Other	-	Hours

10. Current in other types of aircraft? (percent)

47.5	Yes
52.5	No

11. Total military flight hours (median)

1500 Hours

Civilian flight hours in military aircraft (median)

950 Hours

Civilian flight hours in civilian aircraft (median)

500 Hours

Logged combat flight hours? (percent)

42	Yes
58	No

Combat flight hours (median of aviators with combat experience)

1000 Hours

12. Highest qualifications (percent)

	n	Pilot	UT	IP	SIP
UH-1H	71	80.3	4.2	12.7	2.8
UH-1V	19	84.2	5.3	10.5	0
UH-60	1	100	0	0	0
EH-1H	0	0	0	0	0
OH-58	19	89.5	0	0	10.5
CH-47	11	72.7	0	18.2	9.1
Other	3	66.7	0	33.3	0
T-42	0	0	0	0	0
U-3	1	0	0	100	0
U-8	4	75	25	0	0
U-21	7	57.1	0	28.6	14.3
Other	1	0	0	0	100

13. Aviation qualifications (percent)

98	Instrument Ticket
83.2	Terrain Flight (NOE)
56.4	Unaided Night Tactical
31.7	Night Vision Goggles
12.9	Safety Officer
9.9	Maintenance Officer
10.9	Maintenance Test Pilot
6.9	Rotary Wing Instrument Flight Examiner
4	Fixed Wing Instrument Flight Examiner
1	Maintenance Test Flight Examiner
6.9	Other

14. Income from USAR job (percent)

0	Less than $1,000
2	$1,000 to 1,999
4	$2,000 to 2,999
15	$3,000 to 3,999
8	$4,000 to 4,999
15	$5,000 to 5,999
13	$6,000 to 6,999
18	$7,000 to 7,999
10	$8,000 to 8,999
5	$9,000 to 9,999
6	$10,000 to 10,999
0	$11,000 to 11,999
0	$12,000 to 12,999
0	$13,000 to 13,999
0	$14,000 to 14,999
6	$15,000 or more

15. Distance from facility/activity (median)

40 miles from home
46.5 miles from work

One way commuting time to facility/activity (median)

60 minutes from home
65 minutes from work

16. AFTP facility different from UTA/MUTA facility? (percent)

3 Yes
97 No

17. Required to participate in SFTS program? (percent)

45.5 Yes
54.5 No

Number of hours spent annually in SFTS program (median)

12 hours

Distance to SFTS site (median)

50 miles from home
45 miles from work

Commuting time to SFTS site (median)

90 minutes from home
85 minutes from work

Number of single AFTPs attended in last fiscal year (median)

20 single AFTPs

19. Agreement that number of single AFTPs is sufficient (mean/std dev)

3 / 1.5, Very strongly disagree, 7 = Very strongly agree

20. Number of dual AFTPs attended in last fiscal year (median)

2 dual AFTPs

Summary of Demographic/Background Information: **Warrant Officers (n=104)**

21. Agreement that number of dual AFTPs is sufficient (mean/std dev)

    2.8 / 1.5, 1 = Very strongly disagree, 7 = Very strongly agree

22. Availability of resources during evening or weekend AFTPs (mean/std dev)

    3.7 / 1.4, 1 = Almost never available, 7 = Almost always available

    79.6 Percent stating Instructor Pilots not available
    42.9 Percent stating Aircraft not available
    59.2 Percent stating Support Personnel not available

23. Number of AFTPs with IP (median)

    3 AFTPs

24. Number of additional paid hours available each month to meet requirements (median)

    8 hours

25. Additional single AFTPs required per year (median)

    10 AFTPs

26. TOE, MTOE, TDA duty position (percent)

    1 Company/Troop Commander
    5.2 Flight Safety Technician
    0 Executive Officer
    1 Operations Officer
    0 Staff Aviation Officer
    0 Flight Operations Officer
    6.2 Instrument Examiner
    0 Platoon Leader/Commander
    3.1 Section Leader/Commander
    0 Team Leader
    10.3 Instructor Pilot
    9.3 Observation Helicopter Pilot (OH-58)
    46.5 Utility Helicopter Pilot (UH-1)
    7.2 Cargo Helicopter Pilot (CH-47)
    3.1 Utility Airplane Pilot
    2.1 Maintenance Test Pilot
    0 Aircraft Maintenance Technician
    3.1 Other

28. Source of entry into Army Reserve (percent)

20 Civilian - no prior service
19 Civilian - prior military service
27 Direct from active Army
5 Direct from active duty - other military service
13 Direct from Army National Guard
5 Direct from active reserve - other military service
11 Direct from Individual Ready Reserve
0 Other

29. Received IERW flight training at Fort Rucker after joining Army? (percent)

35 Yes
65 No

30. Years/months in current USAR unit (median)

3 years 1.5 months

31. Years/months of total military service (median)

10 years 8 months

32. Years/months in active component (median)

3 years 9 months

Years/months in Army Reserve (median)

6 years 2.5 months

Years/months in other active reserve (median)

Insufficient Data

33. Years/months on military flight orders (median)

7 years 10 months

34. Currently taking a military correspondence course? (percent)

20.2 Yes
79.8 No

35. Expect to take military course in next year? (percent)

52.6 Yes
23.2 No
24.2 Undecided

36. WO grade (percent)

31.7 WO1
23.8 CW2
12.9 CW3
31.7 CW4

37. Primary Military Occupational Specialty (PMOS) (percent)

1 100A - Multiengine Utility Helicopter Pilot
0 100BH - Aeroscout Pilot
80 100B - Utility/Observation Helicopter Pilot
13 100C - Cargo Helicopter Pilot
0 100D - Heavy Lift Helicopter Pilot
6 100Q - Combat Service/Support Fixed Wing Pilot

38. Previously a commissioned officer on Active Duty? (percent)

14.4 Yes
85.6 No

Previously a commissioned officer in Army Reserve? (percent)

10.9 Yes
89.1 No

39. Highest military education level (percent)

68.4 Warrant Officer Candidate Development
13.7 Advanced Course
10.5 Senior Course
7.4 Other

C. Civilian Employment

44. Present employment status (percent)

76.2 Employed full time
5 Self-employed
5.9 Employed part time
9.9 Full-time student
3 Unemployed

45. Professional civilian pilot? (percent)

37.9	Yes
62.1	No

Full-time USAR technician? (percent)

16.1	Yes
83.9	No

Active duty with Army Guard and Reserve (AGR)? (percent)

3.4	Yes
96.6	No

46. Current projected annual income from civilian job (percent)

1.2	Less than $ 5,000
2.3	$5,000 - 9,999
8.1	$10,000 - 14,999
7	$15,000 - 19,999
9.3	$20,000 - 24,999
10.5	$25,000 - 29,999
19.8	$30,000 - 34,999
11.6	$35,000 - 39,999
7	$40,000 - 44,999
7	$45,000 - 49,999
9.3	$50,000 - 59,000
7	$60,000 or above

47 Total income from all sources (percent)

1.2	Less than $ 5,000
2.3	$5,000 - 9,999
3.5	$10,000 - 14,999
8.1	$15,000 - 19,999
4.7	$20,000 - 24,999
8.1	$25,000 - 29,999
11.6	$30,000 - 34,999
8.1	$35,000 - 39,999
15.1	$40,000 - 44,999
10.5	$45,000 - 49,999
10.5	$50,000 - 59,000
16.3	$60,000 or above

48. Company's official leave policy (percent)

50.6 two weeks leave with full pay
18.4 two weeks leave, pays difference between salary and USAR pay
2.3 use of vacation time required
19.5 two weeks leave without pay
5.7 Not applicable - self employed
3.4 other

49. Civilian job supervisor's attitude toward USAR career (mean/std dev)

4.6 / 1.8, 1 = Very negative, 7 = Very positive

50. Hours per week on civilian job (median)

50 hours

51. Does civilian job require overnight travel? (percent)

42 Yes
58 No

Number of nights away from home per month (median)

4 nights per month

52. Effect of civilian job on ability to attend UTAs/MUTAs (mean/std dev)

2.9 / 1.8, 1 = Very easy to get time off, 7 = Very hard to get time off

53. Effect of civilian job on ability to attend AFTPs (mean/std dev)

3.5 / 1.9, 1 = Very easy to get time off, 7 = Very hard to get time off

54. Effect of civilian job on ability to attend ADT (mean/std dev)

4.1 / 1.9, 1 = Very easy to get time off, 7 = Very hard to get time off

55. Effect of civilian job on ability to attend Annual Training (mean/std dev)

2.9 / 1.7, 1 = Very easy to get time off, 7 = Very hard to get time off

(Questions 56 - 66 Pertain to Civilian Job Satisfaction And Are Summarized Below)

Satisfaction with civilian job security (mean/std dev)

5.1 / 1.4, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job pay (mean/std dev)

4.6 / 1.4, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with social aspects of civilian job (mean/std dev)

5.2 / 1.1, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job supervisor (mean/std dev)

4.6 / 1.3, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with growth opportunities in civilian job (mean/std dev)

5.1 / 1.3, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with civilian job in general (mean/std dev)

4.8 / 1.4, 1 = Extremely dissatisfied, 7 = Extremely satisfied

D. Family

71. Is spouse employed? (percent of married aviators)

37.3	Yes - full time
20.1	Yes - part time
9	Self-employed
1.5	Full-time student
31.3	No

73. Spouse's annual income (percent)

15.6	Less than $ 5,000
15.6	$5,000 - 9,999
13.3	$10,000 - 14,999
15.6	$15,000 - 19,999
20	$20,000 - 24,999
6.7	$25,000 - 29,999
4.4	$30,000 - 34,999
2.2	$35,000 - 39,999
2.2	$40,000 - 44,999
0	$45,000 - 49,999
4.4	$50,000 or above

74. Spouse's attitude toward USAR (mean/std dev)

4.7 / 1.6, 1 = Very negative, 7 = Very positive

Children's attitude toward USAR (mean/std dev)

4.9 / 1.4, 1 = Very negative, 7 = Very positive

75. Spouse's influence on USAR career intentions (mean/std dev)

4.6 / 1.4, 1 - Great influence to leave, 7 = Great influence to stay

Children's influence on USAR career intentions (mean/std dev)

4.5 / 1.2, 1 - Great influence to leave, 7 = Great influence to stay

PART III: ARMY RESERVE CAREER INTENTIONS

A. USAR Career Intentions

1. USAR career intentions (percent)

47	Stay for 30-year retirement eligibility
36	Stay for 20-year retirement elibigility
5	Stay in for at least one year but less than 20
4	Get out within next the year
8	Other

2. Intend to leave USAR before retirement eligibility to transfer to ARNG? (percent)

7.4	Yes
92.6	No

Intend to leave USAR before retirement eligibility to go on active duty? (percent)

14.9	Yes
85.1	No

3. How often think about leaving USAR? (mean/std dev)

3 / 1.5, 1 = Almost never, 7 = Almost always

4. Likelihood of seeking part-time job other than USAR? (mean/std dev)

3.3 / 1.9, 1 = Extremely unlikely, 7 = Extremely likely

5. Chances of finding alternative part-time job? (mean/std dev)

3.7 / 2.1, 1 = Chances extremely poor, 7 = Chances extremely good

B. Influences on USAR Career Intentions

6. Reasons for joining the USAR (percent)

84.2	Opportunity to fly
52.5	Pay
38.6	Time invested toward military retirement
34.7	Patriotism/national pride
23.8	Association with other aviators
17.8	Opportunity to improve flying skills
4	Job requirement as USAR technician
2	Other
1	Satisfy military obligation

7. Reasons for remaining in USAR (percent)

70.3	Opportunity to fly
61.4	Pay
58.4	Retirement benefits
25.7	Association with other aviators
22.8	Patriotism/national pride
13.9	Maintain flying proficiency
10.9	Change of pace from civilian job
9.9	Job requirement as USAR technician
0	Other

8. Reasons for possible leaving USAR (percent)

62.4	Administrative details/politics
47.5	Loss of flight status
44.6	Unrealistic training goals for time/resources available
39.6	Decreasing opportunity to fly
34.7	Lack of adequate support personnel/equipment
31.7	Insufficient time allocated to maintain a safe level of proficiency
29.7	Excessive additional nonflying duties
23.8	Conflict with civilian job
20.8	Conflict with family interests
19.8	Increase in training requirements
18.8	Lack of competence in aviation matters by chain of command
17.8	Lack of opportunity to schedule dual AFTPs
17.8	Unequal flight pay (USAR vs Active Component)
12.9	Lack of concern and/or respect for the individual
10.9	Policies concerning retirement points for AFTPs
9.9	Lack of promotion opportunity
7.9	Other
4	Travel time and cost incurred to attend USAR training
1	Requirement to mobilize

C. Satisfaction With the USAR

(Questions 9 - 23 Pertain to USAR Job Satisfaction And Are Summarized Below)

Satisfaction with USAR job security (mean/std dev)

4.7 / 1.5, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR job pay (mean/std dev)

4.6 / 1.3, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with social aspects of USAR job (mean/std dev)

5.2 / 1.0, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR supervisor (mean/std dev)

4.9 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with growth opportunities in USAR job (mean/std dev)

5 / 1.0, 1 = Extremely dissatisfied, 7 = Extremely satisfied

Satisfaction with USAR job in general (mean/std dev)

5 / 1.2, 1 = Extremely dissatisfied, 7 = Extremely satisfied

REFERENCE

Szabo, S. M, Ruffner, J. W., Cross, K. D., & Sanders, M. G. (1986, November). *An Evaluation of theTraining Requirements of Army National Guard Aviators - Phase I: Analysis of Questionnaire Data* . (Technical Report 730). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

APPENDIX

U. S. ARMY RESERVE AVIATOR QUESTIONNAIRE

U.S. ARMY RESERVE AVIATOR QUESTIONNAIRE

BACKGROUND AND PURPOSE

The Reserve Component (RC) aviator must meet the same annual aviation requirements (Aircrew Training Manual and Army Training and Evaluation Program) as the active component aviator. During the past ten years, the training requirements for all aviators have increased significantly. And yet, the RC aviator's allocated training time has remained relatively constant.

In recognition of the RC aviator's potential limitations in meeting the increasing requirements, the First Army Deputy Chief of Staff for Training (DCST) has requested that the Army Research Institute Aviation Research and Development Activity (ARI ARDA), Fort Rucker, Alabama, provide research support to investigate the training requirements of Army Reserve (USAR) aviators in the First Army area. In response to the request, ARI has developed a questionnaire that will be administered to all USAR aviators in the First Army area. The questionnaire will be used to gather information that will help the DCST to make specific recommendations about the training requirements for USAR aviators and about the training resources needed to meet the requirements.

INSTRUCTIONS

The questionnaire has three parts. The first part asks you to (a) evaluate the adequacy of the training requirements and the time allocated for meeting the training requirements, (b) indicate your willingness to spend additional time to meet the training requirements, and (c) identify the obstacles to meeting the training requirements. The second part asks questions about your personal and military characteristics, your civilian employment, and your family. The third part asks you about your USAR career intentions and the factors that may influence your intentions. The actual time that you spend meeting your training requirements will be addressed in a separate questionnaire.

When you have completed the questionnaire, seal it in the attached envelope and give the envelope to the individual in your unit who has been assigned the responsibility for collecting the completed survey forms. The sealed questionnaires will be mailed directly to ARI. Your responses will be confidential and will be used for research purposes only. Since your responses will not be traced to you or to your supervisor, you can feel free to be completely candid in answering the questions.

Thank you for your cooperation.

DATA REQUIRED BY THE PRIVACY ACT OF 1974
(5 U.S.C. 552a)

TITLE OF FORM	PRESCRIBING DIRECTIVE
U.S. Army Reserve Aviator Questionnaire	

1. AUTHORITY

2. PRINCIPAL PURPOSE(S)

The data collected with the attached questionnaire are to be used for research purposes only.

3. ROUTINE USES

The purpose of the research is to determine if the current training requirements for USAR aviators can be completed in the time available for training. The research will provide information about (a) factors (e.g., demographic characteristics, civilian employment) that may affect the USAR aviators' ability to utilize the allocated training time, and (b) the USAR aviators' willingness to spend additional time to meet the training requirements.

When an identifier (e.g., Social Security Number) is required, it is to be used for administrative and statistical control purposes within the confines of the subject research. Full confidentiality of the responses will be maintained.

4 MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION

Your participation in the research is strictly voluntary. You are encouraged to provide complete and accurate information in the interests of the research, but there will be no effect on you for not providing all, or any part of, the information.

You may detach this notice from the questionnaire if you desire to do so.

FORM - Privacy Act Statement - 26 Sep 75

PT CONTROL NUMBER: 5657 DA CONTROL NUMBER: ATZI-AO-86-20

WHAT IS YOUR SOCIAL SECURITY NUMBER?

_____ - _____ - _____

PART I
TRAINING REQUIREMENTS

GENERAL DIRECTIONS: PART I HAS FIVE SECTIONS. EACH SECTION LISTS CURRENT OR PROJECTED TRAINING REQUIREMENTS THAT YOU MAY HAVE TO MEET AS A USAR AVIATOR. THE REQUIREMENTS ARE GROUPED INTO THE FOLLOWING CATEGORIES: INITIAL QUALIFICATION REQUIREMENTS, TRANSITION TRAINING, CONTINUATION TRAINING, AND ADDITIONAL MILITARY REQUIREMENTS.

USE YOUR EXPERIENCE AS A USAR AVIATOR TO PROVIDE THE REQUIRED INFORMATION ABOUT THE ITEMS IN EACH SECTION. THE SECTIONS ARE DESCRIBED BELOW.

- SECTION A: ADEQUACY OF THE TRAINING REQUIREMENTS FOR MAINTAINING A SAFE LEVEL OF PROFICIENCY

  In Section A you are asked to rate the adequacy of the current training requirements for ensuring your personal safety as a USAR aviator.

- SECTION B: ADEQUACY OF THE TIME ALLOCATED FOR MEETING THE TRAINING REQUIREMENTS

  In Section B you are asked to rate the adequacy of the allocated training time for ensuring that you meet the current training requirements.

- SECTION C: WILLINGNESS TO SPEND ADDITIONAL PAID TIME TO MEET THE TRAINING REQUIREMENTS

  In Section C you are asked to rate your willingness to devote additional paid time to the USAR in order to meet your training requirements.

- SECTION D: WILLINGNESS TO SPEND ADDITIONAL NONPAY STATUS TIME TO MEET THE TRAINING REQUIREMENTS

  In Section D you are asked to rate your willingness to devote additional nonpay status time to the USAR in order to meet your training requirements.

- SECTION E: OBSTACLES TO MEETING THE TRAINING REQUIREMENTS

  In Section E, you are asked to identify the characteristics of the training environment that impede or interfere with your ability to meet the training requirements during paid training time.

SECTION A: ADEQUACY OF THE TRAINING REQUIREMENTS FOR MAINTAINING A SAFE LEVEL OF PROFICIENCY

A list of current and projected training requirements for USAR aviators is presented below. Indicate your evaluation of how adequate each of the requirements is for enabling you to maintain a safe level of proficiency as an aviator. In making your evaluation, consider the conditions under which you personally must meet the requirements for your primary aircraft in the Army Reserve.

Use the scale on the right-hand side of the items to rate the adequacy of each of the requirements. A rating of "1" indicates that the requirement is "Much Less Than Adequate For a Safe Level of Proficiency" and a rating of "7" indicates that the requirement is "Much More Than Adequate For a Safe Level of Proficiency." A rating of "4" indicates that the requirement is "About Right For a Safe Level of Proficiency." Check [✓] the box that best reflects your evaluation of the adequacy of each requirement.

Before you rate a category of requirements, be sure to read the note for that category.

QUALIFICATION REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED. CHECK A VALUE FROM "1" to "7" IF YOU QUALIFIED IN THE REQUIREMENT AFTER YOU JOINED A USAR UNIT. THIS SECTION DOES NOT APPLY TO YOUR IERW TRAINING.

	NOT APPLICABLE	MUCH LESS THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY			ABOUT RIGHT FOR A SAFE LEVEL OF PROFICIENCY			MUCH MORE THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY
1. QUALIFICATION IN TERRAIN (NOE) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. QUALIFICATION IN UNAIDED NIGHT TACTICAL FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. QUALIFICATION IN NIGHT VISION GOGGLES (NVG)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. QUALIFICATION IN NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. QUALIFICATION IN OTHER TASKS • (SPECIFY)_____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

TRANSITION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	MUCH LESS THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY			ABOUT RIGHT FOR A SAFE LEVEL OF PROFICIENCY			MUCH MORE THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY
6. TRANSITION TRAINING FOR ALTERNATE/ ADDITIONAL AIRCRAFT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

ADEQUACY OF THE TRAINING REQUIREMENTS FOR
MAINTAINING A SAFE LEVEL OF PROFICIENCY (Continued)

CONTINUATION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	MUCH LESS THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY		ABOUT RIGHT FOR A SAFE LEVEL OF PROFICIENCY			MUCH MORE THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY	
7. CONTINUATION TRAINING IN EMERGENCY TASKS (IN AIRCRAFT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. CONTINUATION TRAINING IN EMERGENCY PROCEDURES (ORALLY OR IN SFTS)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. CONTINUATION TRAINING IN INSTRUMENT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. CONTINUATION TRAINING IN TERRAIN (NOE) FLIGHT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. CONTINUATION TRAINING IN UNAIDED NIGHT TACTICAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. CONTINUATION TRAINING IN NIGHT VISION GOGGLE (NVG) TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13. CONTINUATION TRAINING IN TACTICAL/ SPECIAL TASKS (OTHER THAN TERRAIN FLIGHT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14. CONTINUATION TRAINING IN MISSION TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15. CONTINUATION TRAINING IN ADDITIONAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
16. CONTINUATION TRAINING IN OTHER TASKS e (SPECIFY) _____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

ADDITIONAL MILITARY REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT THAT YOU HAVE NOT YET MET.

	NOT APPLICABLE	MUCH LESS THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY		ABOUT RIGHT FOR A SAFE LEVEL OF PROFICIENCY			MUCH MORE THAN ADEQUATE FOR A SAFE LEVEL OF PROFICIENCY	
17. INFLIGHT EVALUATION/TRAINING OF OTHER AVIATORS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
18. PRE- AND POST-FLIGHT TASKS--e.g., PRE- AND POST-FLIGHT WEATHER BRIEFINGS, FLIGHT RECORDS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
19. TRAINING IN AVIATION ACADEMIC SUBJECTS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
20. NONFLYING AVIATION EVALUATION REQUIREMENTS--e.g., PREPARING FOR, UNDERGOING, AND ADMINISTERING ANNUAL WRITTEN, ORAL EXAM, FLIGHT PHYSICAL, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
21. MILITARY EDUCATION REQUIREMENTS--e.g., UNDERGOING AND ADMINISTERING TRAINING IN BEMS SUSTAINMENT, COMMON SOLDIER SKILLS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
22. PREPARATION FOR INSPECTIONS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

SECTION B: ADEQUACY OF THE TIME ALLOCATED FOR MEETING THE TRAINING REQUIREMENTS

Below is a list of the current and projected USAR training requirements that were presented in Section A. This time, rate the items to indicate your evaluation of how adequate the amount of paid training time is for enabling you to meet the training requirements for your primary aircraft in the Army Reserve.

Use the scale on the right-hand side of the items to rate the adequacy of the allocated time for meeting each of the requirements. A rating of "1" indicates that "Too Little Time is Allocated to the Task" and a rating of "7" indicates that "Too Much Time is Allocated to the Task." A rating of "4" indicates that the "Time Allocated to the Task is About Right." Check [✓] the box that best reflects your judgment of the adequacy of the allocated training time.

Before you rate a category of requirements, be sure to read the note for that category.

QUALIFICATION REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED. CHECK A VALUE FROM "1" to "7" IF YOU QUALIFIED IN THE REQUIREMENT AFTER YOU JOINED A USAR UNIT. THIS SECTION DOES NOT APPLY TO YOUR IERW TRAINING.

	NOT APPLICABLE	TOO LITTLE TIME IS ALLOCATED TO THE TASK		TIME ALLOCATED TO THE TASK IS ABOUT RIGHT			TOO MUCH TIME IS ALLOCATED TO THE TASK	
1. QUALIFICATION IN TERRAIN (NOE) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. QUALIFICATION IN UNAIDED NIGHT TACTICAL FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. QUALIFICATION IN NIGHT VISION GOGGLES (NVG)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. QUALIFICATION IN NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. QUALIFICATION IN OTHER TASKS • (SPECIFY)_____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

TRANSITION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	TOO LITTLE TIME IS ALLOCATED TO THE TASK		TIME ALLOCATED TO THE TASK IS ABOUT RIGHT			TOO MUCH TIME IS ALLOCATED TO THE TASK	
6. TRANSITION TRAINING FOR ALTERNATE/ ADDITIONAL AIRCRAFT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

ADEQUACY OF THE TIME ALLOCATED FOR MEETING THE TRAINING REQUIREMENTS (Continued)

CONTINUATION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	TOO LITTLE TIME IS ALLOCATED TO THE TASK		TIME ALLOCATED TO THE TASK IS ABOUT RIGHT			TOO MUCH TIME IS ALLOCATED TO THE TASK	
7. CONTINUATION TRAINING IN EMERGENCY TASKS (IN AIRCRAFT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. CONTINUATION TRAINING IN EMERGENCY PROCEDURES (ORALLY OR IN SFTS)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. CONTINUATION TRAINING IN INSTRUMENT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. CONTINUATION TRAINING IN TERRAIN (NOE) FLIGHT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. CONTINUATION TRAINING IN UNAIDED NIGHT TACTICAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. CONTINUATION TRAINING IN NIGHT VISION GOGGLE (NVG) TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13. CONTINUATION TRAINING IN TACTICAL/ SPECIAL TASKS (OTHER THAN TERRAIN FLIGHT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14. CONTINUATION TRAINING IN MISSION TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15. CONTINUATION TRAINING IN ADDITIONAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
16. CONTINUATION TRAINING IN OTHER TASKS (SPECIFY)_____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

ADDITIONAL MILITARY REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT THAT YOU HAVE NOT YET MET.

	NOT APPLICABLE	TOO LITTLE TIME IS ALLOCATED TO THE TASK		TIME ALLOCATED TO THE TASK IS ABOUT RIGHT			TOO MUCH TIME IS ALLOCATED TO THE TASK	
17. INFLIGHT EVALUATION/TRAINING OF OTHER AVIATORS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
18. PRE- AND POST-FLYING TASKS--e.g., PRE- AND POST-FLIGHT, WEATHER BRIEFINGS, FLIGHT RECORDS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
19. TRAINING IN AVIATION ACADEMIC SUBJECTS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
20. NONFLYING AVIATION EVALUATION REQUIREMENTS--e.g., PREPARING FOR, UNDERGOING, AND ADMINISTERING ANNUAL WRIT, -10 EXAM, FLIGHT PHYSICAL, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
21. MILITARY EDUCATION REQUIREMENTS--e.g., UNDERGOING AND ADMINISTERING TRAINING IN BTHS SUSTAINMENT, COMMON SOLDIER SKILLS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
22. PREPARATION FOR INSPECTIONS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

SECTION C: WILLINGNESS TO SPEND ADDITIONAL PAID TIME TO MEET THE TRAINING REQUIREMENTS

Below is a list of the current and projected USAR training requirements that were presented in the two previous sections of the questionnaire. This time, rate the items to indicate how willing you are to devote additional paid time to the Army Reserve in order to meet the training requirements in your primary aircraft. In evaluating your willingness to spend additional paid time, consider the total amount of time--both paid and nonpaid--that you already spend on your Army Reserve duties. Then indicate your willingness to spend additional paid time to meet the requirements.

Use the scale on the right-hand side of the items to rate your degree of willingness to spend additional paid time to meet your requirements. A rating of "1" indicates that you are "Very Unwilling to Spend Additional Paid Training Time" and a rating of "7" indicates that you are "Very Willing to Spend Additional Paid Training Time." Check [✓] the box that best indicates the degree of your willingness to devote additional paid time to the Army Reserve in order to meet current or projected training requirements.

Before you rate a category of requirements, be sure to read the note for that category.

QUALIFICATION REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED. CHECK A VALUE FROM "1" to "7" IF YOU QUALIFIED IN THE REQUIREMENT AFTER YOU JOINED A USAR UNIT. THIS SECTION DOES NOT APPLY TO YOUR IERW TRAINING.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL PAID TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL PAID TRAINING TIME
1. QUALIFICATION IN TERRAIN (NOE) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. QUALIFICATION IN UNAIDED NIGHT TACTICAL FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. QUALIFICATION IN NIGHT VISION GOGGLES (NVG)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. QUALIFICATION IN NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. QUALIFICATION IN OTHER TASKS • (SPECIFY)_____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

TRANSITION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL PAID TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL PAID TRAINING TIME
6. TRANSITION TRAINING FOR ALTERNATE/ ADDITIONAL AIRCRAFT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

WILLINGNESS TO SPEND ADDITIONAL PAID TIME TO MEET THE TRAINING REQUIREMENTS (Continued)

CONTINUATION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL PAID TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL PAID TRAINING TIME
7. CONTINUATION TRAINING IN EMERGENCY TASKS (IN AIRCRAFT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. CONTINUATION TRAINING IN EMERGENCY PROCEDURES (ORALLY OR IN SFTS)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. CONTINUATION TRAINING IN INSTRUMENT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. CONTINUATION TRAINING IN TERRAIN (NOE) FLIGHT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. CONTINUATION TRAINING IN UNAIDED NIGHT TACTICAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. CONTINUATION TRAINING IN NIGHT VISION GOGGLE (NVG) TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13. CONTINUATION TRAINING IN TACTICAL/ SPECIAL TASKS (OTHER THAN TERRAIN FLIGHT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14. CONTINUATION TRAINING IN MISSION TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15. CONTINUATION TRAINING IN ADDITIONAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
16. CONTINUATION TRAINING IN OTHER TASKS e (SPECIFY) _____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

ADDITIONAL MILITARY REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT THAT YOU HAVE NOT YET GET.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL PAID TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL PAID TRAINING TIME
17. INFLIGHT EVALUATION TRAINING OF OTHER AVIATORS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
18. PRE- AND POST-FLYING TASKS--e.g., PRE- AND POST-FLIGHT, WEATHER BRIEFINGS, FLIGHT RECORDS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
19. TRAINING IN AVIATION ACADEMIC SUBJECTS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
20. NONFLYING AVIATION EVALUATION REQUIREMENTS--e.g., PREPARING FOR, UNDERGOING, AND ADMINISTERING ANNUAL WRIT, -10 EXAM, FLIGHT PHYSICAL, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
21. MILITARY EDUCATION REQUIREMENTS--e.g., UNDERGOING AND ADMINISTERING TRAINING IN BEMS SUSTAINMENT, COMMON SOLDIER SKILLS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
22. CAREER DEVELOPMENT COURSES--e.g., ADVANCED AND SENIOR COURSES, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
23. ADDITIONAL NONFLYING DUTIES--e.g., PROPERTY BOOK, MOTOR POOL, SECURITY, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
24. PREPARATION FOR INSPECTION	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

SECTION D: WILLINGNESS TO SPEND ADDITIONAL NONPAY STATUS TIME TO MEET THE TRAINING REQUIREMENTS

Below is a list of the current and projected USAR training requirements that were presented in the previous sections of the questionnaire. This time, rate the items to indicate your willingness to devote additional nonpay status time to the Army Reserve in order to meet the training requirements in your primary aircraft. In evaluating your willingness to spend additional nonpay status time, consider the total amount of time--both paid and nonpaid--that you now spend on your Army Reserve duties. Then indicate your willingness to spend additional nonpay status time to meet the requirements.

Use the scale on the right-hand side of the items to rate your degree of willingness to spend additional nonpay status time to meet your requirements. A rating of "1" indicates that you are "Very Unwilling to Spend Additional Nonpay Status Training Time" and a rating of "7" indicates that you are "Very Willing to Spend Additional Nonpay Status Training Time." Check [✓] the box that best indicates the degree of your willingness to devote additional nonpay status time to the Army Reserve in order to meet current or projected training requirements.

Before you rate a category of requirements, be sure to read the note for that category.

QUALIFICATION REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED. CHECK A VALUE FROM "1" to "7" IF YOU QUALIFIED IN THE REQUIREMENT AFTER YOU JOINED A USAR UNIT. THIS SECTION DOES NOT APPLY TO YOUR IERW TRAINING.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME
1. QUALIFICATION IN TERRAIN (NOE) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. QUALIFICATION IN UNAIDED NIGHT TACTICAL FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. QUALIFICATION IN NIGHT VISION GOGGLES (NVG)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. QUALIFICATION IN NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) FLIGHT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. QUALIFICATION IN OTHER TASKS • (SPECIFY)_____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

TRANSITION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME
6. TRANSITION TRAINING FOR ALTERNATE/ ADDITIONAL AIRCRAFT	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

CONTINUATION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME
7. CONTINUATION TRAINING IN EMERGENCY TASKS (IN AIRCRAFT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. CONTINUATION TRAINING IN EMERGENCY PROCEDURES (ORALLY OR IN SFTS)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. CONTINUATION TRAINING IN INSTRUMENT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. CONTINUATION TRAINING IN TERRAIN (NOE) FLIGHT TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. CONTINUATION TRAINING IN UNAIDED NIGHT TACTICAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. CONTINUATION TRAINING IN NIGHT VISION GOGGLE (NVG) TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13. CONTINUATION TRAINING IN TACTICAL/ SPECIAL TASKS (OTHER THAN TERRAIN FLIGHT)	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14. CONTINUATION TRAINING IN MISSION TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15. CONTINUATION TRAINING IN ADDITIONAL TASKS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
16. CONTINUATION TRAINING IN OTHER TASKS • (SPECIFY)_____	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

ADDITIONAL MILITARY REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT THAT YOU HAVE NOT YET MET.

	NOT APPLICABLE	VERY UNWILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME			NEUTRAL			VERY WILLING TO SPEND ADDITIONAL NONPAY STATUS TRAINING TIME
17. INFLIGHT EVALUATION/TRAINING OF OTHER AVIATORS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
18. PRE- AND POST-FLYING TASKS--e.g., PRE- AND POST-FLIGHT, WEATHER BRIEFINGS, FLIGHT RECORDS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
19. TRAINING IN AVIATION ACADEMIC SUBJECTS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
20. NONFLYING AVIATION EVALUATION REQUIREMENTS--e.g., PREPARING FOR, UNDERGOING, AND ADMINISTERING ANNUAL WRIT, -10 EXAM, FLIGHT PHYSICAL, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
21. MILITARY EDUCATION REQUIREMENTS--e.g., UNDERGOING AND ADMINISTERING TRAINING IN BTMS SUSTAINMENT, COMMON SOLDIER SKILLS, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
22. CAREER DEVELOPMENT COURSES--e.g., ADVANCED AND SENIOR COURSES, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
23. ADDITIONAL NONFLYING DUTIES--e.g., PROPERTY BOOK, MOTOR POOL, SECURITY, ETC.	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
24. PREPARATION FOR INSPECTIONS	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

SECTION E: OBSTACLES TO MEETING THE TRAINING REQUIREMENTS

This section deals with obstacles to training in the Army Reserve. An obstacle to training is defined as anything that impedes or interferes with your ability to meet the training requirements in the amount of paid time you are now allocated for Army Reserve training. The following characteristics of the Army Reserve training environment are identified as potential obstacles to training.

- IPs = Unavailability of instructor pilots
- PERS = Unavailability of support personnel (e.g., flight engineer, crew chief, technical observer, etc.)
- A/C = Unavailability of aircraft (includes suitability for terrain and instrument flight)
- EQUIP = Unavailability of support equipment (e.g., night vision goggles, ammunition, fuel, vehicles, etc.)
- AASF = Unsatisfactory operational hours of the Army Aviation Support Facility
- AREAS = Unavailability of training support areas (e.g., ranges, NOE courses, field sites, SFTS, etc.)
- FH = Insufficient number of flight hours
- NON-AV = Non-aviation obstacles (e.g., preparing for inspections, conducting inventories, etc.)
- TIME = Insufficient amount of additional personal time (nonpaid)

Below is a list of the current and projected USAR training requirements that were presented in the previous sections. For each requirement, check [✓] the box below each characteristic that you consider to be an obstacle to training for you. Check as many obstacles as you experience in meeting a particular training requirement. If you experience none of the obstacles in meeting a particular requirement, do not check any of the boxes.

Example A indicates that the aviator finds unavailability of both training support areas and support equipment to be obstacles to meeting the requirement for ARTEP training.

EXAMPLE A	NOT APPLICABLE	IPs	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
ARTEP TRAINING	[0]	[ ]	[ ]	[ ]	[✓]	[ ]	[✓]	[ ]	[ ]	[ ]

Example B illustrates that, since no checks were made in any of the columns, none of the items that are listed are obstacles to meeting the requirement for Instructor Pilot Qualification.

EXAMPLE B	NOT APPLICABLE	IPs	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
INSTRUCTOR PILOT QUALIFICATION	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

For each requirement listed below, check [✓] the box for each characteristic that interferes with your ability to meet the requirement. Before you begin checking a category of requirements, be sure to read the note for that category.

QUALIFICATION REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED. THIS SECTION DOES NOT APPLY TO YOUR IERW TRAINING.

	NOT APPLICABLE	IPs	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
1. QUALIFICATION IN TERRAIN (NOE) FLIGHT	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2. QUALIFICATION IN UNAIDED NIGHT TACTICAL FLIGHT	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
3. QUALIFICATION IN NIGHT VISION GOGGLES (NVG)	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
4. QUALIFICATION IN NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) FLIGHT	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
5. QUALIFICATION IN OTHER TASKS • (SPECIFY)_____	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

OBSTACLES TO MEETING THE TRAINING REQUIREMENTS (Continued)

- IPs = Unavailability of instructor pilots
- PERS = Unavailability of support personnel (e.g., flight engineer, crew chief, technical observer, etc.)
- A/C = Unavailability of aircraft (includes suitability for terrain and instrument flight)
- EQUIP = Unavailability of support equipment (e.g., night vision goggles, ammunition, fuel, vehicles, etc.)
- AASF = Unsatisfactory operational hours of the Army Aviation Support Facility
- AREAS = Unavailability of training support areas (e.g., ranges, NOE courses, field sites, SFTS, etc.)
- FH = Insufficient number of flight hours
- NON-AV = Non-aviation obstacles (e.g., preparing for inspections, conducting inventories, etc.)
- TIME = Insufficient amount of additional personal time (nonpaid)

TRANSITION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU WERE QUALIFIED PRIOR TO JOINING THE ARMY RESERVE OR IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	IPs	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
6. TRANSITION TRAINING FOR ALTERNATE/ ADDITIONAL AIRCRAFT	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

CONTINUATION TRAINING

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT IN WHICH YOU HAVE NOT YET BEEN QUALIFIED.

	NOT APPLICABLE	IPs	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
7. CONTINUATION TRAINING IN EMERGENCY TASKS (IN AIRCRAFT)	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8. CONTINUATION TRAINING IN EMERGENCY PROCEDURES (ORALLY OR IN SFTS)	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9. CONTINUATION TRAINING IN INSTRUMENT	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10. CONTINUATION TRAINING IN TERRAIN (NOE) FLIGHT TASKS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11. CONTINUATION TRAINING IN UNAIDED NIGHT TACTICAL TASKS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12. CONTINUATION TRAINING IN NIGHT VISION GOGGLE (NVG) TASKS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13. CONTINUATION TRAINING IN TACTICAL/ SPECIAL TASKS (OTHER THAN TERRAIN FLIGHT)	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14. CONTINUATION TRAINING IN MISSION TASKS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15. CONTINUATION TRAINING IN ADDITIONAL TASKS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16. CONTINUATION TRAINING IN OTHER TASKS • (SPECIFY)_____	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

OBSTACLES TO MEETING THE TRAINING REQUIREMENTS (Continued)

- IPs = Unavailability of instructor pilots
- PERS = Unavailability of support personnel (e.g., flight engineer, crew chief, technical observer, etc.)
- A/C = Unavailability of aircraft (includes suitability for terrain and instrument flight)
- EQUIP = Unavailability of support equipment (e.g., night vision goggles, ammunition, fuel, vehicles, etc.)
- AASF = Unsatisfactory operational hours of the Army Aviation Support Facility
- AREAS = Unavailability of training support areas (e.g., ranges, NOE courses, field sites, SFTS, etc.)
- FH = Insufficient number of flight hours
- NON-AV = Non-aviation obstacles (e.g., preparing for inspections, conducting inventories, etc.)
- TIME = Insufficient amount of additional personal time (nonpaid)

ADDITIONAL MILITARY REQUIREMENTS

NOTE: CHECK "0" FOR NOT APPLICABLE FOR EACH REQUIREMENT THAT YOU HAVE NOT YET MET.

	NOT APPLICABLE	IPs	PERS	A/C	EQUIP	AASF	AREAS	FH	NON-AV	TIME
17. INFLIGHT EVALUATION/TRAINING OF OTHER AVIATORS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18. NON-TRAINING FLIGHTS--e.g., VIP TRANSPORT, STATIC DISPLAY, ETC.	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19. PRE- AND POST-FLYING TASKS--e.g., PRE- AND POST-FLIGHT, WEATHER BRIEFINGS, FLIGHT RECORDS, ETC.	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20. NONFLYING AVIATION EVALUATION REQUIREMENTS--e.g., PREPARING FOR, UNDERGOING, AND ADMINISTERING ANNUAL WRIT, -10 EXAM, FLIGHT PHYSICAL, ETC.	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21. MILITARY EDUCATION REQUIREMENTS--e.g., UNDERGOING AND ADMINISTERING TRAINING IN BTMS SUSTAINMENT, COMMON SOLDIER SKILLS, ETC.	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
22. CAREER DEVELOPMENT COURSES--e.g., ADVANCED AND SENIOR COURSES, ETC.	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23. ADDITIONAL NON-FLYING DUTIES--e.g., PROPERTY BOOK, MOTOR POOL, SECURITY, ETC.	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24. PREPARATION FOR INSPECTIONS	[0]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

NOTE: IF YOU HAVE EXPERIENCED OBSTACLES OTHER THAN THE ONES LISTED IN THIS SECTION IN MEETING QUALIFICATION, TRANSITION, CONTINUATION, OR ADDITIONAL MILITARY REQUIREMENTS, PLEASE REPORT THEM ON THE COMMENT PAGE IN SECTION D.

PART II
BACKGROUND INFORMATION

GENERAL DIRECTIONS: PART II CONSISTS OF QUESTIONS THAT ARE DESIGNED TO PROVIDE BACKGROUND INFORMATION ABOUT YOU AS A USAR AVIATOR. THE QUESTIONS ARE GROUPED INTO FOUR SECTIONS ACCORDING TO THE TYPE OF INFORMATION THAT THEY PROVIDE. THE FOUR SECTIONS ARE AS FOLLOWS:

- SECTION A: PERSONAL CHARACTERISTICS
- SECTION B: MILITARY CHARACTERISTICS
- SECTION C: CIVILIAN EMPLOYMENT
- SECTION D: FAMILY FACTORS

ANSWER EACH ITEM BY CHECKING [✓] THE APPROPRIATE BLOCK OR BY WRITING THE REQUIRED INFORMATION IN THE APPROPRIATE SPACE.

SECTION A: PERSONAL CHARACTERISTICS

1. What is your age?

   _____ Years

2. What is your sex? (check one)

   [ ] Female
   [ ] Male

3. What is your ethnic group? (check one)

   [ ] American Indian
   [ ] Asian
   [ ] Black
   [ ] Caucasian
   [ ] Hispanic
   [ ] Other (specify)_____

4. What is your present marital status? (check one)

   [ ] Single--never been married
   [ ] Married--never been divorced
   [ ] Married--previously divorced
   [ ] Divorced and not remarried
   [ ] Separated
   [ ] Widow/Widower

5. How many children do you presently have at home?

   _____ Children

6. What is your highest civilian education level? (check one)

   [ ] Some high school (did not graduate)
   [ ] High school graduate or GED equivalent (no college)
   [ ] Trade or technical school diploma (no college)
   [ ] Some college (no degree)
   [ ] Associate degree
   [ ] Bachelors degree
   [ ] Masters degree
   [ ] Ph.D.
   [ ] Other professional degree (e.g., M.D., D.D.M., D.V.M., J.D., etc.)

7. How many hours per month do you spend in community activities (e.g., Lion's Club, church, PTA, Little League coach, etc.)? (if none, write 0)

   _____ Hours Per Month

SECTION B: MILITARY CHARACTERISTICS

8. Indicate the name of the aviation unit to which you are assigned.

_____

_____

9. Check [✓] the type of military aircraft that is your primary aircraft in your current TOE, MTOE, or TDA duty position. Indicate the total number of military flight hours that you have in this aircraft. (check only one)

Rotary Wing	Primary	Hours
UH-1H	[ ]	_____
UH-1V	[ ]	_____
UH-60	[ ]	_____
EH-1H	[ ]	_____
OH-58	[ ]	_____
CH-47	[ ]	_____
Other	[ ]	_____

- (specify type of aircraft)_____

Fixed Wing	Primary	Hours
T-42	[ ]	_____
U-3	[ ]	_____
U-8	[ ]	_____
U-21	[ ]	_____
Other	[ ]	_____

- (specify type of aircraft)_____

10. Are you current in any other types of aircraft? (check one)

[ ] Yes
[ ] No

- If yes:
  a. specify the other type(s) of military aircraft in which you are current, and

  _____

  _____

  b. specify the other type(s) of civilian aircraft in which you are current.

  _____

  _____

11. Indicate the total number of flight hours that you have accumulated in each of the categories defined below. (round to nearest 50 hours)

- Military Flight Hours: Total number of hours that you have accumulated in a military aircraft while on military status.

  Total Military Flight Hours:_____

- Civilian Flight Hours: Total number of hours that you have accumulated as a civilian in military or civilian aircraft.

  Total Civilian Flight Hours in Military Aircraft:_____

  Total Civilian Flight Hours in Civilian Aircraft:_____

- Combat Flight Hours: Total number of hours that you have accumulated as a military pilot/copilot in a combat environment.

  Total Combat Flight Hours:_____

12. Indicate the highest qualification you hold in each of the military aircraft in which you are current. (check one for each aircraft in which current)

UT = Unit Trainer
IP = Instructor Pilot
SIP = Standardization Instructor Pilot

Rotary Wing

UH-1H	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
UH-1V	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
UH-60	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
EH-1H	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
OH-58	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
CH-47	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
Other	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP

- (specify type of aircraft)_____

Fixed Wing

T-42	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
U-3	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
U-8	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
U-21	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP
Other	[ ] Pilot	[ ] UT	[ ] IP	[ ] SIP

- (specify type of aircraft)_____

13. Which of the following aviation qualifications do you currently hold? (check as many as you are current in)

[ ] Instrument Ticket
[ ] Terrain Flight (NOE)
[ ] Unaided Night Tactical
[ ] Night Vision Goggles
[ ] Safety Officer
[ ] Maintenance Officer
[ ] Maintenance Test Pilot
[ ] Rotary Wing Instrument Flight Examiner
[ ] Fixed Wing Instrument Flight Examiner
[ ] Maintenance Test Flight Examiner
[ ] Other (specify)_____

_____

_____

14. What is your current projected annual income from your position as an Army Reserve aviator? (Do not include income from your job as a full time Army Reserve technician.) (check one)

[ ] Less than $ 1,000
[ ] $ 1,000 - $ 1,999
[ ] $ 2,000 - $ 2,999
[ ] $ 3,000 - $ 3,999
[ ] $ 4,000 - $ 4,999
[ ] $ 5,000 - $ 5,999
[ ] $ 6,000 - $ 6,999
[ ] $ 7,000 - $ 7,999
[ ] $ 8,000 - $ 8,999
[ ] $ 9,000 - $ 9,999
[ ] $10,000 - $10,999
[ ] $11,000 - $11,999
[ ] $12,000 - $12,999
[ ] $13,000 - $13,999
[ ] $14,000 - $14,999
[ ] $15,000 or more

15. Indicate the location of the support facility, flight activity facility, or operating activity at which your Unit Training Assemblies (UTAs/MUTAs) are conducted.

Location:_____

- How far away from this facility/activity do you live and work?

Distance From Home _____ Miles

Distance From Work _____ Miles

- On the average, how long does it take you to commute (one-way) to the facility/activity from your home and your place of work?

Time From Home _____ Hours and _____ Minutes

Time From Work _____ Hours and _____ Minutes

16. Is the facility at which your Additional Flight Training Periods (AFTPs) are conducted different from the facility at which your UTAs/MUTAs are conducted? (check one)

[ ] Yes
[ ] No

17. Are you required to participate in the SFTS program?

[ ] Yes
[ ] No

- If yes, number of hours annually:_____Hours

- If yes, indicate the location of the SFTS at which you train.

Location:_____

- How far away from this location do you live and work?

Distance From Home _____ Miles

Distance From Work _____ Miles

- On the average, how long does it take you to commute (one-way) to this location?

Time From Home _____ Hours and _____ Minutes

Time From Work _____ Hours and _____ Minutes

18. During the last fiscal year, how many single AFTPs were you able to participate in?

Number Of Single AFTPs_____

19. Rate your agreement with the following statement about single AFTPs:

The number of single AFTPs that I received during the last fiscal year was sufficient for me to maintain a satisfactory level of safety and proficiency in continuation training tasks. (check one)

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Very Strongly Disagree			Neutral			Very Strongly Agree

20. During the last fiscal year, how many dual AFTPs were you able to participate in?

Numer of Dual AFTPs_____

21. Rate your agreement with the following statement about dual AFTPs:

The number of dual AFTPs that I received during the last fiscal year was sufficient for me to maintain a satisfactory level of safety and proficiency in continuation training tasks. (check one)

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Very Strongly Disagree			Neutral			Very Strongly Agree

22. Are resources available during evening or weekend AFTPs to meet mandatory individual aircrew training requirements, e.g., AAPART evaluations, emergency procedures training, currency rides, etc.? (check one)

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Resources Are Almost Never Available			Resources Are Sometimes Available			Resources Are Almost Always Available

- If your rating was "1", "2", or "3", indicate which resource(s) is(are) normally not available. (check all that apply)

[ ] Instructor Pilot
[ ] Aircraft
[ ] Support Personnel

23. How many of your evening or weekend AFTPs during the last year were conducted with an IP for evaluation or training?

Number Of AFTPs With IP _____

24. Considering all of your present time commitments, how many additional paid hours per month should you afford to spend meeting USAR training requirements? _____Hours/Month

25. How many additional single AFTPs would you need to maintain a safe level of proficiency?
_____AFTPs

26. What is your TOE, MTOE, or TDA duty position in the USAR? (check one)

[ ] Company/Troop Commander
[ ] Flight Safety Technician
[ ] Executive Officer
[ ] Operations Officer
[ ] Staff Aviation Officer
[ ] Flight Operations Officer
[ ] Instrument Examiner (FW and RW)
[ ] Platoon Leader/Commander
[ ] Section Leader/Commander
[ ] Team Leader
[ ] Instructor Pilot
[ ] Observation Helicopter Pilot (OH-58)
[ ] Utility Helicopter Pilot (UH-1)
[ ] Cargo Helicopter Pilot (CH-47)
[ ] Utility Airplane Pilot
[ ] Maintenance Test Pilot
[ ] Aircraft Maintenance Technician
[ ] Other (specify)_____

27. What is your primary additional duty position (i.e., not a TOE/TDA position) in the Army Reserve? (If no additional duty position, write N/A.)

Additional Duty Position_____

28. What is your source of entry into the Army Reserve? (check one)

[ ] Civilian--no prior military service
[ ] Civilian--prior military service (more than six months break in service)
[ ] Direct from active Army (less than six months break in service)
[ ] Direct from active duty--other military service (less than six months break in service)
[ ] Direct from Army National Guard
[ ] Direct from active reserve--other military service
[ ] Direct from Individual Ready Reserve
[ ] Other (specify)_____

29. Did you receive your Initial Entry Rotary Wing (IERW) flight training at Fort Rucker after you joined the Army Reserve? (check one)

[ ] Yes
[ ] No

30. How long have you been in your current Army Reserve aviation unit, regardless of changes in the unit's designation?

_____ and _____
Years Months

31. How many total years of military service do you have that are creditable toward retirement?

_____ and _____
Years Months

32. How many years of military service do you have in each of the categories defined below?

- Active Component Service: Total years of service in active Army or other military branch.

  Active Component Service: _____ and _____
  Years Months

- Army Reserve Service: Total years of service in an Army Reserve Troop Program Unit.

  Army Reserve Service _____ and _____
  Years Months

- Other Active Reserve Service: Total years of service in an active military reserve component other than the USAR Troop Program Unit (e.g., National Guard).

  Other Active Reserve Service: _____ and _____
  Years Months

33. In total, how many years on military flight orders do you have?

_____ and _____
Years Months

34. Are you currently taking a military correspondence course? (check one)

[ ] Yes
[ ] No

35. Do you expect to attend a military course that requires you to take time off from your civilian job within the next year? (check one)

[ ] Yes
[ ] No
[ ] Undecided

NOTE: If you are an aviation warrant officer, answer items 36 - 39; then proceed to Section C. If you are a commissioned officer, answer items 40 - 43; then proceed to Section C.

ITEMS FOR AVIATION WARRANT OFFICERS ONLY

36. What is your current grade? (check one)

[ ] WO1
[ ] CW2
[ ] CW3
[ ] CW4

37. What is your Primary Military Occupational Specialty (PMOS)? (check one)

[ ] 100A--Multiengine Utility Helicopter Pilot
[ ] 100BH--Aeroscout Pilot
[ ] 100B--Utility/Observation Helicopter Pilot (includes UH-1C/M models)
[ ] 100C--Cargo Helicopter Pilot
[ ] 100D--Heavy Lift Helicopter Pilot
[ ] 100Q--Combat Service/Support Fixed Wing Pilot

38. Were you previously a commissioned officer aviator either on active duty or in the Army Reserve? (check both, if appropriate)

Active Duty	Army Reserve
[ ] Yes	[ ] Yes
[ ] No	[ ] No

39. What is your highest military education level?

[ ] Warrant Officer Candidate Development
[ ] Advanced Course
[ ] Senior Course
[ ] Other (specify)_____

ITEMS FOR COMMISSIONED OFFICERS ONLY

40. What is your current grade? (check one)

[ ] O1 Second Lieutenant
[ ] O2 First Lieutenant
[ ] O3 Captain
[ ] O4 Major
[ ] O5 Lieutenant Colonel
[ ] O6 Colonel

41. What branch are you currently serving in? (check one)

[ ] Aviation
[ ] Infantry
[ ] Armor
[ ] Field Artillery
[ ] Air Defense Artillery
[ ] Signal Corps
[ ] Military Intelligence
[ ] Transportation Corps
[ ] Medical Service Corps
[ ] Other (specify)_____

42. What is your specialty skill identifier (SSI)? (check one)

[ ] 15A--General Aviation
[ ] 15B--Combat Aviation
[ ] 15C--Combat Support Aviation
[ ] 15M--Combat Intelligence Aviation
[ ] 15S--Combat Communications Aviation
[ ] 15T--Aviation Logistics
[ ] 67J--Aeromedical Evacuation
[ ] Other (specify) _____

43. What is your highest military education level?

[ ] Basic Course
[ ] Advanced Course
[ ] Command and Special Staff
[ ] Command and General Staff
[ ] War College

SECTION C: CIVILIAN EMPLOYMENT

44. Which item best describes your present employment status? (check one)

[ ] Employed full time
[ ] Self-employed
[ ] Employed part time
[ ] Full-time student
[ ] Unemployed

NOTE: If you indicated in item 44 that you are presently employed--either full time or part time, or self-employed--answer items 45 - 51. If you indicated in item 44 that you are presently unemployed, or are a full-time student, skip items 45 - 51 and proceed directly to Section D on Page 20.

45. What is your civilian occupation (include full time or part time civilian employment and full time employment as a technician in the USAR)?
Civilian Occupation: _____

- Are you a professional civilian pilot?
  [ ] Yes
  [ ] No
- Are you a full-time USAR technician?
  [ ] Yes
  [ ] No
- Are you on active duty with the Army Guard and Reserve (AGR)?
  [ ] Yes
  [ ] No

46. What is your current projected annual income from your civilian occupation? (check one)

[ ] Less than $ 5,000
[ ] $ 5,000 - $ 9,999
[ ] $10,000 - $14,999
[ ] $15,000 - $19,999
[ ] $20,000 - $24,999
[ ] $25,000 - $29,999
[ ] $30,000 - $34,999
[ ] $35,000 - $39,999
[ ] $40,000 - $44,999
[ ] $45,000 - $49,999
[ ] $50,000 - $59,999
[ ] $60,000 or above

47. What is your total annual income from all sources, not including spouse's income? (check one)

[ ] Less than $ 5,000
[ ] $ 5,000 - $ 9,999
[ ] $10,000 - $14,999
[ ] $15,000 - $19,999
[ ] $20,000 - $24,999
[ ] $25,000 - $29,999
[ ] $30,000 - $34,999
[ ] $35,000 - $39,999
[ ] $40,000 - $44,999
[ ] $45,000 - $49,999
[ ] $50,000 - $59,999
[ ] $60,000 or above

48. What is your company's official leave policy regarding your two weeks of Army Reserve annual training? (check one)

[ ] Employer gives two weeks military leave with full pay
[ ] Employer gives two weeks military leave and pays the difference between salary and Army Reserve pay
[ ] Employer requires use of vacation time
[ ] Employer gives two weeks leave without pay (does not include vacation time)
[ ] Not applicable--I am self-employed
[ ] Other (specify) _____

49. Rate your immediate supervisor's attitude toward your Army Reserve career. (check one)

[0] Not Applicable I am self-employed	[1] Very Negative	[2]	[3]	[4] Neutral	[5]	[6]	[7] Very Positive

50. How many hours do you spend on your civilian job in a typical work week? Include the hours that you spend at your place of work and any additional hours that you spend on work-related activities (e.g., business entertainment, at-home paperwork, commuting time, etc.).

_____ Hours Per Week

51. Does your civilian job require overnight travel?

[ ] Yes
[ ] No

- o If yes, indicate the average number of nights away from home that your job requires per month.

_____Nights Per Month

Items 52 - 55 list specific types of USAR training periods. Use the 7-point rating scale on the right-hand side of each item to indicate the extent to which the work schedule on your civilian job affects your ability to get time off to attend each of the training periods. Check [✓] the block that indicates your rating.

	TRAINING PERIOD	EFFECT OF CIVILIAN JOB SCHEDULE						
52.	Weekend UTAs/MUTAs	[1] Very Easy to Get Time Off	[2]	[3]	[4] Neutral	[5]	[6]	[7] Very Hard to Get Time Off
53.	AFTPs	[1] Very Easy to Get Time Off	[2]	[3]	[4] Neutral	[5]	[6]	[7] Very Hard to Get Time Off
54.	ADT (Man Days)	[1] Very Easy to Get Time Off	[2]	[3]	[4] Neutral	[5]	[6]	[7] Very Hard to Get Time Off
55.	Annual Training	[1] Very Easy to Get Time Off	[2]	[3]	[4] Neutral	[5]	[6]	[7] Very Hard to Get Time Off

Items 56 - 70 describe specific characteristics of your civilian job. Use the scale on the right-hand side of the items to indicate your degree of satisfaction with each characteristic. Rate the items on a scale ranging from "1" to "7." A rating of "1" indicates that you are "Extremely Dissatisfied" with the characteristic; a rating of "7" indicates that you are "Extremely Satisfied" with the characteristic. Check [✓] the box that best indicates your degree of satisfaction with each characteristic.

		Extremely Dissatisfied			Neutral			Extremely Satisfied
56.	The amount of job security you have in your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
57.	The amount of pay and fringe benefits you receive in your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
58.	The amount of personal growth and development you get in doing your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
59.	The people you talk to and work with on your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
60.	The degree of respect and fair treatment you receive from your immediate supervisor on your civilian job. ([ ] check here if self-employed)	[1]	[2]	[3]	[4]	[5]	[6]	[7]
61.	The feeling of worthwhile accomplishment you get from doing your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
62.	The chance to get to know other people while on your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
63.	The amount of support and guidance you receive from your immediate supervisor on your civilian job. ([ ] check here if self-employed)	[1]	[2]	[3]	[4]	[5]	[6]	[7]
64.	The degree to which you are fairly paid for what you contribute to your civilian work organization.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
65.	The amount of independent thought and action you can exercise in your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
66.	How secure things look for you in the future in your civilian work organization.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
67.	The chance to help other people while at your civilian work.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
68.	The amount of challenge in your civilian job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
69.	The overall quality of the supervision you receive in your civilian work. ([ ] check here if self-employed)	[1]	[2]	[3]	[4]	[5]	[6]	[7]

70. In general, how satisfied are you with your civilian job? (check one)

[1] Extremely Dissatisfied [2] [3] [4] Neutral [5] [6] [7] Extremely Satisfied

SECTION D: FAMILY

NOTE: If you are married and/or have children at home, answer items 71 - 75; then proceed to Part III of the questionnaire on page 21. If you are not married and/or do not have children, proceed immediately to Part III.

71. Is your spouse employed? (check one)

[ ] Yes--full time
[ ] Yes--part time
[ ] Self-employed
[ ] Full-time student
[ ] No
[ ] Not applicable--I am not married

72. What is your spouse's occupation (if applicable)?

Spouse's Occupation:_____

73. What is your spouse's annual income? (check one if applicable)

[ ] Less than $ 5,000
[ ] $ 5,000 - $ 9,999
[ ] $10,000 - $14,999
[ ] $15,000 - $19,999
[ ] $20,000 - $24,999
[ ] $25,000 - $29,999
[ ] $30,000 - $34,999
[ ] $35,000 - $39,999
[ ] $40,000 - $44,999
[ ] $45,000 - $49,999
[ ] $50,000 or more

74. Which of the following describes your spouse's and/or your children's attitudes toward the Army Reserve?

SPOUSE'S ATTITUDE (check one if applicable)

[1] Very Negative [2] [3] [4] Neutral [5] [6] [7] Very Positive

CHILDREN'S ATTITUDE (check one if applicable)

[1] Very Negative [2] [3] [4] Neutral [5] [6] [7] Very Positive

75. Which of the following describes the influence that your spouse and/or children have on your Army Reserve career intentions?

SPOUSE'S INFLUENCE (check one if applicable)

[1] Great Influence to Leave [2] [3] [4] No Influence [5] [6] [7] Great Influence to Stay

CHILDREN'S INFLUENCE (check one if applicable)

[1] Great Influence to Leave [2] [3] [4] No Influence [5] [6] [7] Great Influence to Stay

PART III
ARMY RESERVE CAREER INTENTIONS

PART III ASKS YOU TO PROVIDE INFORMATION ABOUT THE FOLLOWING AREAS:

- SECTION A: USAR career intentions
- SECTION B: Influences on your USAR career intentions
- SECTION C: Satisfaction with the USAR
- SECTION D: Comments about the USAR

SECTION A: USAR CAREER INTENTIONS

1. Which of the following best reflects your present USAR career intentions, assuming you remain on flight status? (check one)

   [ ] Stay for 30-year retirement eligibility
   [ ] Stay for 20-year retirement eligibility
   [ ] Stay in for at least one more year, but get out prior to 20-year retirement eligibility
   [ ] Get out within the next year
   [ ] Other (specify)_____

2. Do you intend to leave the USAR prior to reaching retirement eligibility in order to:

   - Transfer to the Army National Guard
     [ ] Yes
     [ ] No
   - Go on active duty
     [ ] Yes
     [ ] No

3. How often do you think about leaving the Army Reserve?

   [1] Almost Never [2] [3] [4] Sometimes [5] [6] [7] Almost Always

4. How likely is it that you would seek a part time job if you were not in the Army Reserve? (check one)

   [1] Extremely Unlikely [2] [3] [4] Neither Likely Nor Unlikely [5] [6] [7] Extremely Likely

5. What are your chances of obtaining a part time civilian job with similar pay and benefits as you receive in the Army Reserve? (check one)

   [1] Chances Extremely Poor [2] [3] [4] Chances Neither Good Nor Poor [5] [6] [7] Chances Extremely Good

SECTION B: INFLUENCES ON USAR CAREER INTENTIONS

6. What are the primary reasons that you originally joined the Army Reserve? (check up to three)

   [ ] Opportunity to fly
   [ ] Pay
   [ ] Time invested toward military retirement
   [ ] Opportunity to improve flying skills
   [ ] Association with other aviators--i.e., camaraderie
   [ ] Patriotism/national pride
   [ ] Satisfy military obligation--i.e., alternative to draft
   [ ] Job requirement--I am a full time USAR technician
   [ ] Other (specify)_____

7. What are the most important factors that have influenced or might influence you to remain in the Army Reserve? (check up to three)

   [ ] Opportunity to fly
   [ ] Pay
   [ ] Retirement benefits
   [ ] Association with other aviators--i.e., camaraderie
   [ ] Patriotism/national pride
   [ ] Maintain flying proficiency
   [ ] Change of pace from civilian job
   [ ] Job requirement--I am a full time USAR technician
   [ ] Other (specify)_____

8. What are the most important factors that have influenced or might influence you to leave the Army Reserve? (check up to six)

   [ ] Administrative details/politics
   [ ] Unrealistic training goals for time/resources available
   [ ] Lack of competence in aviation matters by chain of command
   [ ] Lack of adequate support personnel/equipment
   [ ] Conflict with civilian job
   [ ] Conflict with family interests
   [ ] Lack of concern and/or respect for the individual
   [ ] Loss of flight status
   [ ] Requirement to mobilize
   [ ] Decreasing opportunity to fly
   [ ] Policies concerning retirement points for AFTPs
   [ ] Lack of opportunity to schedule dual AFTPs
   [ ] Excessive additional nonflying duties
   [ ] Lack of promotion opportunity
   [ ] Travel time and cost incurred to attend USAR training
   [ ] Unequal flight pay (USAR aviator flight pay versus active component aviator flight pay)
   [ ] Increase in training requirements (e.g., NVG, unaided night)
   [ ] Insufficient time allocated to maintain a safe level of proficiency
   [ ] Other (specify)_____

SECTION C: SATISFACTION WITH THE USAR

Items 9 - 23 describe specific characteristics of your job as a USAR aviator (does not include your job as a full time Army Reserve technician). Use the scale on the right-hand side of the items to indicate your degree of satisfaction with each characteristic. Rate the items on a scale ranging from "1" to "7." A rating of "1" indicates that you are "Extremely Dissatisfied" with the characteristic and a rating of "7" indicates that you are "Extremely Satisfied" with the characteristic. Check [✓] the box that best indicates your degree of satisfaction with each characteristic.

	Extremely Dissatisfied			Neutral			Extremely Satisfied
9. The amount of job security you have in your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. The amount of pay and fringe benefits you receive in your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. The amount of personal growth and development you get in doing your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. The people you talk to and work with on your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13. The degree of respect and fair treatment you receive from your immediate supervisor on your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14. The feeling of worthwhile accomplishment you get from doing your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15. The chance to get to know other people while on your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
16. The amount of support and guidance you receive from your immediate supervisor on your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
17. The degree to which you are fairly paid for what you contribute to the Army Reserve.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
18. The amount of independent thought and action you can exercise in your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
19. How secure things look for you in the future in the Army Reserve.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
20. The chance to help other people while at work in the Army Reserve.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
21. The amount of challenge in your Army Reserve job.	[1]	[2]	[3]	[4]	[5]	[6]	[7]
22. The overall quality of the supervision you receive in your Army Reserve work.	[1]	[2]	[3]	[4]	[5]	[6]	[7]

	Extremely Dissatisfied			Neutral			Extremely Satisfied
23. In general, how satisfied are you with your job as an Army Reserve aviator (does not include your job as a full time Army Reserve technician)? (check one)	[1]	[2]	[3]	[4]	[5]	[6]	[7]

SECTION D: COMMENTS ABOUT THE USAR

24. If you have additional comments about your Army Reserve career intentions and/or the factors that influence your intentions, please make them in the space below.

COMMENTS:

25. List those factors not covered in this questionnaire that affect your ability to meet your USAR training requirements.

Working Paper 90-01

WP ARIARDA 90-01

A Review of Factors Influencing the Design and Evaluation of Aircraft Display Symbology

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MDA903-87-C-0523

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WORKING PAPER

A REVIEW OF FACTORS INFLUENCING THE DESIGN AND EVALUATION OF AIRCRAFT DISPLAY SYMBOLOGY

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U.S. Army Research Institute Aviation
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Fort Rucker, Alabama

March 1990

A REVIEW OF FACTORS INFLUENCING THE DESIGN AND EVALUATION OF AIRCRAFT DISPLAY SYMBOLOGY

CONTENTS

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ARIARDA	Army Research Institute Aviation Research and Development Activity
AVSCOM	Army Aviation Systems Command
CRT	Cathode Ray Tube
HDD	Head Down Display
HMD	Helmet Mounted Display
HUD	Head Up Display
LOS	Line of Sight
PNVS	Pilot Night Vision System
SME	Subject Matter Expert

A REVIEW OF FACTORS INFLUENCING THE DESIGN AND EVALUATION OF AIRCRAFT DISPLAY SYMBOLOGY

Introduction

As a result of advances in engineering technology, each successive generation of military aircraft incorporates avionics and other new subsystems that are designed to enhance crew performance during combat missions. To operate these subsystems effectively and safely, crewmembers must rapidly assimilate large and varied amounts of information from several different sources. This substantial amount of information must be displayed to crewmembers in ways that contribute to the natural, rapid operation of the aircraft and its various subsystems.

Designers have responded to the information requirements by developing integrated visual display devices such as Head Up Displays (HUDs), Helmet Mounted Displays (HMDs), and multifunction Head Down Displays (HDDs). HUDs and HMDs display information by projecting flight and weapons symbology onto a combining glass mounted either on top of the instrument panel (as in the case of HUDs) or immediately in front of the crewmember's eyes (as in the case of HMDs). The purpose of HUDs and HMDs is to enable the crewmember to receive essential flight and weapons information without the need to scan the instrument panel (Egan & Goodson, 1978). Multifunction HDDs are mounted on the instrument panel and also are capable of presenting symbolic flight and weapons information.

In some aircraft, HUDs, HMDs, and HDDs also are capable of presenting an image of the external environment to the crewmember (e.g., infrared imagery from a remote sensor). Thus, by viewing the display, the crewmember can see both the projected symbology and an image of the external environment.

An example of an HMD that allows the pilot to view flight and weapons symbology superimposed on visual imagery is the Pilot Night Vision System (PNVS) designed for the Army's AH-64 attack helicopter. The PNVS incorporates a monocular HMD that presents the AH-64 pilot with a variety of symbolic information such as:

- compass heading,
- airspeed,
- altitude,
- groundspeed,
- gunner's line of sight (LOS),
- aircraft position relative to a point on the ground,

- orientation of the aircraft relative to the pilot's head position, and
- computed weapons impact point.

Flight and weapons information from the PNVS is conveyed by a set of 27 symbols overlaid on a 30° by 40° image of the external visual scene provided by an infrared sensor.

Display systems incorporating flight and weapons symbology, such as the PNVS, may facilitate performance by presenting necessary information to the crewmember in an efficient and timely manner. For example, Abbott et al. (1980a; 1980b) found that pilots were willing to fly with less space between aircraft when precise symbolic information about a simulated traffic pattern was presented on their cockpit display. The researchers also noted that, rather than disrupting the traffic pattern by altering course, pilots corrected spacing by changing altitude.

The efficiency of display systems is determined partially by the amount of time required to locate and comprehend the important information being displayed. The time to locate and comprehend vital information is, in turn, influenced heavily by the choice of symbols. Even small variations in the structure of a symbol may affect its utility. For example, Detro and Bateman (1983) found that changes in the length of a tracking line significantly affected pilots' accuracy while performing a simulated weapons release task.

Despite the importance of symbol design, however, several researchers have noted that display symbols usually are selected on the basis of the designers' experience with previous generations of display devices or from surveys of potential users' opinions (e.g., Shrager, 1977; Egan & Goodson, 1978; Taylor, 1984). Shrager described the symbology design process as "evolutionary" rather than guided by the results of empirical research. He pointed out that design decisions based on experience with previous generations of electromechanical instruments may not be inherently "wrong," but that the design of new displays should not be constrained by the technological restrictions of previous instruments. A similar position has been taken by Tatro and Roscoe (1986).

The selection of the AH-64 PNVS symbology followed a similar pattern. Very little empirical information was available to guide the selection of symbols. Furthermore, the Army organizations tasked with developing the symbology did not possess the means (i.e., a fully reconfigurable simulator) to test design alternatives. Buckler (1978)

reported that a committee of subject matter experts (SMEs) conducted an informal analysis of the information required by the crew to perform representative AH-64 flight and weapons tasks. As a result of that analysis, the committee recommended the current PNVS symbology format. Thus, the PNVS symbology set was selected largely on the basis of SME opinion, with many of the candidate symbols chosen because they had been used in other aircraft displays.

No evaluation has been made to determine the degree to which AH-64 PNVS symbology enhances or degrades crew performance during critical mission tasks. Nevertheless, the design standard for future military helicopters is patterned after the existing AH-64 PNVS symbology (Department of Defense, 1984). However, some deviations from the standard are being recommended for the displays planned for the Army's MH-60K utility helicopter and the MH-47E cargo helicopter (International Business Machines, 1988). To date, no evaluation has been conducted to determine the impact of these changes on crew performance.

Thus, valid criteria must be developed empirically for use in (a) evaluating existing display symbologies and (b) designing and evaluating future aircraft display symbologies. The Army Research Institute Aviation Research and Development Activity (ARIARDA) was tasked by the Army Aviation Systems Command (AVSCOM) to initiate research to meet these needs. Work began on the project in February, 1987.

As the first step in this effort, the literature pertaining to display symbology was reviewed to identify factors that may affect the utility of aircraft display symbology. Subsequently, the effect of these factors on crew performance, both singly and in combination, needs to be investigated with a systematic program of research.

The results of the literature review are presented in the three sections that comprise the remainder of this paper. The first section summarizes research on symbol coding dimensions and strategies. The second section summarizes other symbol, display, and human factors issues that may affect the utility of aircraft display symbols. The final section presents conclusions based on the literature review.

Coding Factors

This section summarizes research that has been conducted in attempts to identify coding factors that may affect the utility of individual symbols used for aircraft displays. Changes in physical dimensions, such as minor alterations in

the shape of a line, may create numerous distinctly recognizable variations in symbols. For example, the shape of a few simple line figures can be altered to create an alphabet.

McCallum and Rogers (1982) conducted an extensive literature review in an attempt to identify issues critical to the initial development of symbols for visual displays. They identified 10 fundamental coding dimensions and discussed their applicability to computer-generated topographic maps and tactical data displays. The 10 dimensions are:

- shape,
- alphanumeric coding,
- size,
- numerosity,
- inclination,
- brightness,
- color,
- flash rate,
- stereo depth, and
- apparent movement.

The relevance of these coding dimensions to aircraft displays is summarized in the subsections below. Also discussed below are research findings on two additional coding dimensions not covered in the McCallum and Rogers (1982) review. They are:

- ancillary modifiers and
- motion.

Shape Coding

Shape is one of the most common and most flexible coding dimensions. McCallum and Rogers (1982) reported that simple shapes generally are identified more quickly and accurately than complex shapes. The level of abstraction of the shape also influences the speed and accuracy of identification. Shapes that closely resemble an object may elicit quick and accurate recognition responses, whereas highly abstract shapes may require additional time to interpret.

Some shapes such as alphanumerics, pictorial symbols, or faces may acquire "iconicity" or "natural" meanings that are functionally distinct from the original coding dimensions. For example, even highly stylized symbols in the shape of smiling or frowning faces have potential applications because they may be identified easily and accurately even when they have little relevance to the task (McCallum & Rogers, 1982; Wickens, 1984; Remington & Williams, 1986). However, Christ

and Corso (1983) found that the initial advantage of alphanumeric symbols over geometric shapes decreases after subjects gain experience recognizing the shapes.

Alphanumeric Coding

Alphanumeric coding is a special form of shape coding. Letters and digits are commonly used to display precise data, such as distance or measures of altitude, but are frequently overlooked as potential "tags" for abstract information. If alphanumeric coding is not reserved intentionally for precise communications, the iconicity of letters and digits makes them extremely effective symbols for abstract information.

In some experimental applications, researchers report that alphanumeric coding is superior to other forms of shape coding (e.g., Christ & Corso, 1983; Remington & Williams, 1986). However, McCallum and Rogers (1982) note that the legibility of alphanumeric symbol sets, or fonts, is greatly influenced by the mode of display (e.g., paper vs. cathode ray tube [CRT]). This finding suggests that particular attention must be given to the selection of alphanumerics used in aircraft displays. Although extensive research has been conducted on alphanumeric coding, only a small percentage of the studies is applicable to the design of visual displays.

Size Coding

Size coding has potential value because it can rapidly convey basic information about relative size, proximity, or quantity. McCallum and Rogers (1982) conclude that the use of size coding to present more detailed information may require the addition of a scale or other standardized reference. Without such aids, individuals tend to quantify symbolic representations only on the basis of relative rather than absolute size.

Numerosity Coding

Numerosity (i.e., the number of symbols displayed with one meaning) can convey information either about quantity or the density of features. Quantity coding, such as the number of weapons remaining, is used when the absolute number of items is the basis for concern. Density coding, such as terrain contour lines, is often employed when the issue is the relative frequency of units within a standard area.

McCallum and Rogers (1982) conclude that a maximum of five or six numerosity coded symbols can be identified accurately during brief presentations.

Inclination Coding

Clock hands are examples of symbols that represent differing quantities depending on their inclination. In several experiments reviewed by McCallum and Rogers (1982), subjects demonstrated reasonable accuracy in identifying a symbol at various inclinations. They noted, however, that such coding might not be readily adaptable to some CRT displays because of the rapid degradation in legibility that can occur when lines are presented at different angles on the pixel matrix.

Research investigating the "mental rotation" of three dimensional objects may be pertinent to the use of inclination coding for symbols on aircraft displays. Shepard and Metzler (1971) presented subjects with line drawings of simple three dimensional objects. Then they presented the subjects with drawings (of the same or different objects) at angles other than that of the original presentations. More time was required to identify the objects as either "same" or "different" as the difference between the orientation of the original presentation and the orientation of the second presentation increased. Shepard and Metzler found a linear relationship between mean recognition time and the angle of rotation. They concluded that the observers were "mentally rotating" the symbols at a fairly constant rate of about 60° per second in order to compare them with a mental image of the original presentation. Their findings suggest that some symbols may have a "natural" orientation that may interfere with the effectiveness of inclination coding.

Brightness Coding

Brightness generally refers to the perceived intensity of a light source. Its usefulness as a symbol coding dimension in aircraft displays is limited by the interaction between ambient light and perceived brightness. McCallum and Rogers (1982) recommended that no more than three brightness levels be used in operational settings. Schmit (1984) pointed out an additional limitation of brightness coding for location or aiming symbology on HUDs; there is a risk that operators may be unable to identify targets within or near a brightness coded symbol if the symbol is brighter than the outside world (which varies, of course). Speculatively,

brightness coding may be useful as a cueing mechanism or to indicate a change in status, even with these constraints.

Color Coding

A large number of colors are easily distinguished by individuals with normal color vision. McCallum and Rogers (1982) cited research indicating that, with practice, a minimum of 28 different colors can be identified as coding steps, even when the colored symbols are viewed against colored backgrounds. Several studies have shown that color, either as a symbol itself, or as a symbol modifier, markedly decreases reaction times (e.g., Schmit, 1984; Christ & Corso, 1983). One of the studies reviewed by McCallum and Rogers reported reaction time savings as great as 300% when color was used as redundant cueing for the symbols in a complex visual display. These studies suggest that redundant color coding is likely to be very effective as a cueing mechanism in aircraft displays. Zenyuh, Reising, and McClain (1987) found that color-coded pitch bars improved pilots' ability to recover from extreme unusual attitudes in a generic advanced fighter cockpit simulator. However, Taylor (1984) pointed out that coding areas on visual displays with color (e.g., grouping together related symbols or indicating a search area) may mask natural cues from the external environment.

Flash Rate Coding

A small number (between two and four) of flash rates have been demonstrated to be accurately identifiable; however, the use of flash rate coding traditionally has been viewed as both annoying and distracting. McCallum and Rogers (1982) concluded that the usefulness of flash rate coding for conveying information is very limited. However, they reported a number of studies demonstrating that flash rate coding is useful as a cueing mechanism. Flashing cues may be particularly effective in reducing search or reaction time in complex displays where large numbers of symbols are overlaid on imagery.

Stereo Depth Coding

Stereo depth coding is a technique in which symbols are presented at different apparent depths through the mechanism of binocular disparity. McCallum and Rogers (1982) described stereo depth coding as a "relatively new and exotic" dimen-

sion. Extensive research must be conducted before this coding dimension can be implemented on aircraft displays.

Apparent Movement Coding

Symbols that are not mobile but appear to move while remaining in one position on a display can be generated by sequential presentation of alternating light sources. This effect is commonly used in advertising displays to create the illusion of motion (a wheel may appear to spin at different rates, for example). On an aircraft display, this principle might be used to attract attention or to indicate values such as changes in velocity. McCallum and Rogers (1982) found very little research on the use of apparent movement as a coding dimension. They concluded that additional research is required to determine the usefulness of this dimension in a symbology set.

Ancillary Modifiers

The use of symbol modifiers such as the addition of a trail of dots to indicate travel history or a dashed line to indicate a predicted path of travel is a commonly used coding dimension. Other ancillary modifiers include symbol components such as underscores and diacritical marks. For example, a caret might be included near an aircraft symbol to indicate a potential threat. In studies conducted by Remington and Williams (1986), subjects apparently employed a search strategy of first identifying the primary symbol and then examining any modifying characteristics. Reaction time to symbols increased with the addition of ancillary modifiers. However, the increase in reaction time varied as a function of the type of primary coding dimension employed. That is, reaction time increased more for modified geometric shapes than for modified digits. The researchers also noted that reaction times for both modified and unmodified symbols increased as the number of marked symbols on the display increased.

Motion

Symbols used on aircraft displays exhibit a range of mobility. Some symbols are fully dynamic. That is, they may change locations on the display or move in and out of the display area to represent certain dynamic relationships, such as the line of sight (LOS) of a sensor system. Frank (1979) noted that "research on dynamic virtual image displays is

essentially non-existent." Other symbols are less dynamic. For example, a line may "grow" out from a point of origin to represent suitable constraints for weapons release. The crewmember's task is to estimate the line's rate of growth and deploy the weapons as the line reaches the target symbol. Detro and Bateman (1983) examined the differences between discrete and continuous growth of such an indicator as it affected pilots' accuracy in performing a simulated weapons release task. They found that a continuous growth motion promoted better accuracy.

The coding dimensions discussed above do not represent an exhaustive list of all possible coding dimensions; however, they are representative of the dimensions most commonly reported in the literature. In addition, display designers often use combinations of coding dimensions to create "compound" symbol codes. Very little research has been conducted to investigate the utility of compound codes on aircraft displays.

Additional Symbology Research Issues

A number of additional symbology, display, and human factors issues that may affect the utility of symbols in aircraft displays were identified during the literature review. The most relevant of these issues are:

- discriminability,
- clutter,
- stress and arousal,
- practice effects, and
- cueing and search strategies.

Each of these issues is discussed in the subsections that follow.

Discriminability

Some symbols, because of their physical characteristics or their meaningfulness (either associated or inherent), are more easily discriminated than others. Additional factors that may affect the discriminability of symbols within a single display include the physical location of the symbol, the number of distractor symbols, and the degree of similarity of the symbols.

Discriminability of symbols used in visual displays is easily measured. One method is to measure the latency or accuracy of a response to a given symbol stimulus. Another method (e.g., Christ & Corso, 1983) is to present the symbol

stimulus in the presence of other, potentially distracting, symbols. Response time and/or accuracy is then measured under varying conditions.

In applied settings, the discriminability task requires the operator to evaluate an existing symbol set. The discriminability of symbols within a set (or within a single coding dimension) can be measured as the experimenter systematically changes the stimulus and display conditions. A number of factors influencing discriminability, such as the similarity of symbols in the set, have been investigated in this manner.

Geisleman, Landee, and Christen (1982) used similar methods to develop a performance based algorithm. Their algorithm provides an estimate of discriminability by comparing the candidate symbol with a set of standard symbols that have empirically established values of discriminability. The algorithm can be used to rank the discriminability of potential additions to an existing symbol set or to assess the relative discriminability of symbology subsets. Pearson and Shew (1980) used such an algorithm to evaluate the discriminability of numerous symbols as they developed a "best" set for use in tactical displays.

Christ and Corso (1983) conducted a broader between-dimension comparison of discriminability. They compared three highly discriminable coding dimensions consisting of two alphanumeric sets, geometric shapes, and colored dots. As expected, when a stimulus symbol (developed from any of these dimensions) was included in a control set, it was easily and quickly identified. However, the initial advantages each of these dimensions had in respect to other less discriminable dimensions were attenuated by extended practice.

Clutter

Aircraft displays are frequently described as having "too many symbols" or being "cluttered," but operational definitions of clutter differ markedly. For example, Kopala, Reising, Calhoun, and Herron (1983) operationally defined a display with 30 symbols as cluttered when compared with a display of 10 symbols. However, Abbott et al. (1980a; 1980b) found that pilots considered air traffic displays with only six aircraft symbols to be cluttered.

Factors other than the number of symbols contribute to a perception of clutter, but evaluations of these factors are

almost wholly subjective. Egan and Goodson (1978) noted that clutter was a complaint in "every survey of pilots using HUDs," but the concept of clutter was so "poorly defined that it was not very useful." The pilots' solution to clutter was to turn off the HUD. Opittek (1973) also noted this "solution." He reported that pilots were turning off their HUDs because the devices actually interfered with performance. Thus, there are potential interactions between the concept of "clutter" and the pilot's current workload. Other interactions may exist between clutter and (a) the scale of presentation, (b) the complexity of the external visual image, (c) the particular symbology being used, and (d) the amount of practice the subject has received.

Information processing studies by Thorndyke (1980) further address clutter. Thorndyke found that the perceived size, or distance, between two symbols is a function of the time required to physically scan the space between them on a display (or "mentally scan" an image of that display). If the intervening space contains symbols, the distance may be judged greater due to the additional scanning time. This is particularly important since the time to scan a display and locate a particular symbol may be lengthened due to descriptive but unnecessary information.

Studies by Wurfel (1984) and Abbott et al. (1980a; 1980b) suggest that clutter may be more a function of the relevance (i.e., pertinence to the task) of the information presented, than simply the number of symbols. From these studies, it appears that, if crewmembers perceive a display as cluttered, some of the information that is being presented is either not relevant or cannot be understood. This suggests that pilots' complaints about clutter are an important source for determining how aircrews process symbolic information from displays.

In an effort to reduce clutter, at least in terms of the number of symbols displayed, some designers have incorporated symbol reduction strategies into their display systems. One method is to have pilots identify what subsets of the total information available are required for particular tasks or modes of flight. The designer uses the information provided by the pilots to derive decision rules. The decision rules form the basis for choosing subsets of symbols tailored specifically to the particular tasks or flight modes of interest. The subsets can then be selected by the operator in response to task requirements. As Schmit (1982) noted, the appropriateness of the decision rules determines the effectiveness of the symbol reduction strategy.

Designers of the AH-64 PNVS display attempted to develop such a declutter option by dividing the 27 PNVS symbols into subsets that can be selected by the pilot in response to four modes of flight (i.e., hover, bob-up, transition, and cruise). Much of the same information, however, was considered essential for each mode. Therefore, the resulting subsets have extensive overlap and most of the 27 symbols are displayed in each mode. Apparently the designers were caught in a dilemma posed, on one hand, by a requirement to declutter the display and, on the other hand, by a requirement to include all critical information. Their reluctance to eliminate potentially critical information is not unique. Frank (1979) noted that pilots who use displays equipped with symbol reduction strategies report that they have too little control over the displayed information.

Some researchers have predicted that future symbol reduction strategies will be developed in the form of expert systems (e.g., Shrager, 1977; Frank, 1979; Schmit, 1984). Rather than designing predetermined subsets, an expert system would, theoretically, present only those symbols appropriate to the aircraft's and pilot's current situation. Such an expert system would require a computer-based model of all the emergent situations a military aircraft may encounter. The task of developing such a model and creating a set of "appropriate" rules to determine what information should be displayed under all the mission conditions is impossible with the present state of the art in expert systems.

Another method of limiting the total number of symbols on a display system (and potentially reducing clutter) is to assign some symbols multiple meanings. For example, the cued LOS symbol on the AH-64 PNVS can either represent the gunner's LOS or the computed rounds impact point for the 30-mm cannon, depending on the setting of a control panel switch. This method reduces the number of symbols, but is likely to confuse crewmembers by introducing potential sources of ambiguity, especially under the high workload and stressful conditions encountered during operation of military aircraft. Practice locating symbols on a visual display may reduce the time required for visual search, but according to some researchers (e.g., Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977), only if the stimulus-response relationship remains consistent. However, recent research by Durso, Cooke, Breen, and Schvaneveldt (1987) suggests that after extensive practice, a reduced search rate is possible with some inconsistently mapped symbols. Additional research is required to determine whether this type of symbol reduction strategy can be used effectively on aircraft displays.

Stress and Arousal

Stress and other forms of arousal may alter the way an individual processes information presented by symbology. For example, Easterbrook (1959) reported that the range of cues a pilot uses to guide his actions may be restricted during a state of heightened arousal. Williams (1982; 1985) found that increases in cognitive load reduce the area that can be attended to on a visual display. More recently, Bertera (cited in Moroze and Koonce, 1983) suggested that individuals under stress tend to process information at a more concrete level. Consequently, before using abstract symbols, designers should consider the cognitive load associated with the task and other stress and arousal demands imposed by the environment.

Practice Effects

Most coding dimensions require some amount of practice before they can be interpreted effectively. Variations in either the quantity or quality of practice may account for some of the individual differences in performance noted in the symbology literature. Practice locating visual stimuli has been shown to reduce the time required for visual searches. As reported above, Christ and Corso (1983) found that practice overcame the initial disadvantages of the coding dimensions they employed. With extensive practice, it is possible that highly trained military pilots may compensate for some of the potential disadvantages of existing aircraft display symbology.

"Automatic processing" may partially compensate for poorly designed symbology. According to Schneider and Shiffrin (1977) and Shiffrin and Schneider (1977), there are at least two methods of mentally processing incoming visual stimuli. The first method, "controlled processing," is characterized by a slow search that requires focused attention to identify the stimulus. However, after practice (Schneider and Shiffrin originally used a 20,000 trial paradigm), a second method, "automatic processing," may be possible. Automatic processing is characterized by a rapid search through the stimulus array (from which the stimulus seems to "jump out" without the searcher's focused attention). Fisk and Schneider (1981) found that the process of target recognition in a vigilance task could be automaticized through practice and thereby greatly improved.

Through practice, the crews of modern military aircraft may develop automatic processing capabilities. Under normal

operating conditions, such capabilities may partially compensate for poorly designed symbols. Such capabilities also may reduce the perception of clutter. However, the ability to process visual display symbology automatically may deteriorate under the stress of emergency situations or combat.

Cueing and Search Factors

The methods by which people select visual cues and the manner in which they initiate and terminate searches have not been fully considered during the selection of symbols and the design of displays. Schmit (1977) suggested that the search of a visual display entails a two stage serial process of: (a) rapid global extraction, and (b) slower detailed extraction. Thus, in displays with high symbol content, a wide field of view, or both, cueing may serve to direct attention quickly to pertinent areas of the display for global extraction, and to allow more time for detailed extraction.

The location of symbols on the display (or of symbol modifiers in relation to the symbols) may affect how the information is processed. For example, Schmit (1982) found that humans are unable to control the voluntary encoding of information in an area of one to two degrees around the point of visual fixation. The location and movement of symbols with respect to display-control compatibility also must be considered. For example, in a helicopter, the symbol representing acceleration should move in the same direction the cyclic moves to produce the desired acceleration.

Conclusions

This literature review surveyed research on factors that may affect the utility of symbology used on aircraft displays. A considerable body of literature reports the results of investigations into coding dimensions and other factors that affect the utility of individual symbols. Few researchers, however, have attempted to apply their findings to the selection and design of symbols for the complex visual displays found in modern military aircraft. Thus, the existing literature is of limited value in guiding the development of an "optimal" set of aircraft display symbology.

The integrated visual displays in modern military aircraft are capable of presenting information about flight and weapons systems in a variety of symbol formats and are not restricted by the technical design limitations of older mechanical or electromechanical displays. However, little

research has been conducted to guide the selection of symbols for cockpit visual displays. Studies typically have been limited to particular aircraft displays or to specific mission tasks. These studies have not produced conclusions that can be generalized to the design of symbology for advanced displays or additional mission tasks. Pearson and Shew (1980), for example, report that they could find no studies to suggest the kind of symbols that are best for tactical displays. Moreover, they could find no research on the effects that number and types of symbols have on operator performance and mission effectiveness.

Attempts to duplicate aircraft performance characteristics and complex mission tasks in the laboratory are difficult, labor intensive, and expensive. Additionally, advancing technology and a lack of display design standards make each aircraft display system virtually unique. Kopala et al. (1983) recommended that "any studies of symbology sets to be used by highly loaded operators performing complex series of tasks should be evaluated in a simulated environment." However, this type of applied research--aimed at producing improvements to an existing display system--probably will not advance our knowledge of the underlying perceptual and cognitive factors that ultimately determine the usefulness of a symbol set. The goal of symbology research in applied settings is usually limited to the design of a few symbols to represent the information required by the operator in a specific task environment. Such experiments provide little guidance for the development of future symbology.

Without empirical support, visual display designers are forced to rely heavily on the opinions of subject matter experts who may have little experience using visual display symbology and who may be unaware of possible display alternatives. Reports by Herron (1980) and Hart and Loomis (1980) suggest that the value of subjective evaluation of symbology, even by highly qualified pilots, is questionable.

A systematic investigation of the perceptual and cognitive factors affecting the use of symbology is necessary before the conclusions of more applied research can be interpreted clearly. Presently, there are few findings from basic perception or cognition research that apply directly to aircraft symbology design problems.

In addition, there are several important issues that have been neglected by the research community. For example, designers have insufficient information about the effects of simultaneously viewing display symbology and the external visual scene on HUDs and HMDs (see Roscoe, 1987). Advocates

of HUDs and HMDs (see Weintraub, 1987) maintain that properly collimated symbology and external visual scene information can be processed more or less in parallel, but Fisher, Haines, and Price (1980) provide evidence to the contrary. As another example, we understand little about the problems associated with presenting information from two or more frames of reference within the same integrated display. This problem is particularly acute for displays that combine horizontal and vertical situation information, such as the AH-64 PNVS display. Researchers have, however, started to address this issue (e.g., Abbott, Nataupsky, & Steinmetz, in press).

In summary, design decisions about symbols to be used in aircraft visual displays should be based on a knowledge of the operators' information requirements and an understanding of how operators perceive and process symbolic information. Egan and Goodson (1978) conclude that little is known about what symbology is best for aircraft visual displays. This literature review supports their conclusion; no existing set of symbology is clearly "best" for any single aircraft or mission task. Despite years of research and operational experience, no empirically valid criteria have been developed to guide the design and evaluation of future aircraft display symbology.

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Working Paper

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ARMY AVIATION SIMULATOR TASK TRAINING CAPABILITIES:
A REVIEW OF ARIARDA WORK

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ARMY AVIATION SIMULATOR TASK TRAINING CAPABILITIES: A REVIEW OF ARIARDA WORK

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ARMY AVIATION SIMULATOR TASK TRAINING CAPABILITIES: A REVIEW OF ARIARDA WORK

Introduction

Purpose

The Directorate of Simulation, requested the Army Research Institute's Aviation Research and Development Activity (ARIARDA) to provide information concerning those Army aviation tasks that can be trained with flight simulators. There is no family-wide systematic assessment of simulator training effectiveness for the synthetic flight training systems (SFTS) that the Army has in its inventory. However, ARIARDA does have data from a number of research efforts which relate to this issue. The following is a compilation of relevant data from ARIARDA research documents concerning those tasks that can be trained in simulators.

ARIARDA Simulation Research

The simulator research program at ARIARDA has followed a two-pronged approach. In one approach the efficacy of fielded simulators in training programs was examined. The bulk of the data was acquired in this way. The evaluations of the UH-60, AH-1, and CH-47 flight simulators are a few examples of this approach. The second direction taken in conducting simulator effectiveness research concerns the evaluation of simulator technology in specially designed research simulators. The Training Research Simulator (TRS) and the Simulator Training Research Advanced Testbed for Aviation (STRATA) are examples of this strategy.

The TRS is a modified UH-1 instrument flight simulator that has been employed in several experiments to determine the value of simulator visuals in training initial entry rotary wing (IERW) students. The STRATA simulator, on the other hand, is being used to explore the value of simulator design alternatives for advanced qualification and skill maintenance for Army aircrews. The STRATA program has just gotten underway so no data are available for this analysis. However, ARIARDA will publish ongoing research results on a regular basis.

Methodology

The following summary of the ARIARDA research addresses the concerns of Army aviation simulator effectiveness. The reader should be cautioned that the experiments upon which this data are based do not necessarily follow the same design. In some cases the objectives were focussed on different issues regarding training effectiveness. The use of a method which yields

information on pilot or crew performance in the actual aircraft subsequent to simulator training was the generally preferred methodology when making statements about simulator effectiveness. This paradigm, called transfer of training, can be difficult to accomplish in a dynamic training setting and is resource intensive. In many cases, tradeoffs must be accepted if data were to be collected. The remainder of this discussion will describe the tasks trained in Army aviation simulators. It will also present data collected by ARIARDA which details the effectiveness of these simulators for training various flight tasks. Finally, gaps in knowledge about skill acquisition and transfer of training with flight simulators will be discussed with an eye to future research efforts.

Army Aviation: Systems and Techniques

Figure 1 is provided as a very general indication of the way Army aviation training is provided. Figure 1 illustrates how qualification progresses from IERW and aircrew qualification course (AQC) at USAAVNC through crew and force-on-force qualification in Army units. The types of skills emphasized throughout this progression, which may last for the entire career of an aviator, are listed across the top starting with flight skills and terminating with skills which allow units to succeed in combat. In the body of Figure 1 are listed the tools which are usually employed to provide these at the various qualification levels. Although this matrix is highly simplified, it serves to point out the emphasis which seems to have been placed upon the use of flight simulators for individual skill acquisition rather than collective, tactical skills training. As we go from the top left of the chart, to the bottom right, it can be seen that the Army increasingly relies upon aircraft and force-on-force exercises at the National Training Center (NTC) and Joint Readiness Training Center (JRTC) to provide the skills and qualifications necessary for the more collective types of tasks.

Full-mission simulators find their greatest use in the IERW and AQC levels. Aside from AIRNET, which is used as a combat development tool, and future planned (but unfunded) simulators such as the aviation combined arms tactical trainer (AVCATT), and mobile aircrew sustainment trainer (MAST), little use has been made of collective training simulators for Army aviation. The work done by ARIARDA has followed this same trend. More information is available concerning the effectiveness of simulators designed to train individual flying skills than crew or team skills.

SKILLS

	QUALIFICATION LEVEL (Guiding Documents)	FLIGHT	WEAPONS	TACTICS	TEAM	JOINT OPERATIONS	COMBINED OPERATIONS
INSTITUTION	IERW (Lesson Plans) Standards	SIM & A/C	———	———	———	———	———
	AQC (ATM)	SIM & A/C	SIM & A/C (PROCEDURES)	———	———	———	———
	ADVANCED COURSE			AIRNET	AIRNET		
UNIT	CREW (None)	SIM & A/C	SIM & A/C (PROCEDURES)	NTC	NTC	JRTC NTC	
	TEAM (None)			NTC	NTC	JRTC	?
	UNIT (ARTEP)			NTC	NTC	JRTC	?
	FORCE-ON-FORCE			NTC	NTC	JRTC	?

Figure 1. Systems and Techniques Employed in Army Aviation Training

Findings

IERW

The 2B24, the first of the SFTS systems, was evaluated at the Aviation Center in 1975 (Caro, Isley & Jolley, 1975) to determine its suitability for use in the instrument phase of the IERW program for transition to the UH-1 Helicopter. Table 1 details the tasks trained with this device during this evaluation. As can be seen, all the tasks attempted in the 2B24 led to successful learning and effectively transferred to the UH-1 aircraft. (Blank spaces on Table 1 represent either tasks not attempted in the simulator or tasks for which data were not collected for the specific simulator listed.)

In FY83, ARIARDA began to examine the value of visual simulation for training primary flight students. The program, Training Helicopter Initial Entry Students in Simulators (THIESIS), started with a feasibility study (Dohme, 1993). This study trained ten officer students in the AH1FS on the skills taught in the TH-55 primary phase of flight training. These students were compared to a matched group of TH-55 trained students. Upon completion of the experimental simulator training, THIESIS students were phased into IERW. The comparison indicated that there were no differences between the simulator trained group and the TH-55 trained group at the end of IERW on either flight or academic grades across all seven phases of the course: primary, transition, basic instruments, advanced instruments, night, combat skills I and combat skills II. The tasks trained in the THIESIS project are listed in Table 2. The success of this effort led ARIARDA to build the UH-1 training research simulator (UH1TRS).

The UH1TRS includes a high fidelity cab with hydraulic control loaders, hydraulic seat shaker and a five degree-of-freedom cascaded motion base. Three out-the-window displays were added by mounting 27-inch (68.5 cm) monitors and collimating optics to provide a front window view for the pilot and copilot positions. A right side window for the pilot position is also provided. Each display has a viewing area of approximately 60 degrees horizontally by 40 degrees vertically. In the course of the research program, three different image generators (IGs) have been used: a very low cost system (Silicon Graphics IRIS 2400T), a low cost system (Bolt, Beranek, and Newman 120TX/T), and a moderate cost system (Evans and Sutherland ESIG-500H). A more detailed description of the UH1TRS is available in Dohme (1991).

The UH1TRS was used in four transfer of training experiments (Dohme, 1991) to determine the value of various simulator visual systems to support training for eight primary phase maneuvers: takeoff to hover, hover taxi, hovering turns, hovering

Table 1

Tasks Trained in Army Flight Simulators - ARIARDA Data
IERW Student Training

INSTRUMENTS	THIESIS (AH1FS)	UH1TRS	UH1FS (2B24)
Procedures			
Cockpit procedures	Yes	Yes	Yes
Before landing check			Yes
Engine shut down			Yes
Flight planning			Yes
Circuit breakers			Yes
Takeoff			
Instrument takeoff			Yes
Basic Flight			
Climb (straight)			Yes
Level off			Yes
Straight & level flight (inst)			Yes
90° level turn			Yes
Unusual attitudes			Yes
Standard instrument departure			Yes
Lost radio procedures			Yes
DF steer			Yes
Emergencies			
Engine failure - inflight			Yes
Engine restart - inflight			Yes
Emergency flight panel			Yes
Engine fire inflight			Yes
Fuel boost pump failure			Yes
Governor failure (high side)			Yes
Governor failure (low side)			Yes
Hydraulic power failure			Yes
Instrument failures			Yes
Engine/transmission failure			Yes
Electrical system malfunction			Yes
Approach			
GCA			Yes
VOR/RMI			Yes
ADF/RMI			Yes
ILS			Yes
Enroute			
ARTC enroute procedures			Yes
Instrument cross country			Yes

(Note: Blank spaces represent tasks not attempted in simulator or data not collected for task.)

Table 2

Tasks Trained in Army Flight Simulators - ARIARDA Data
IERW Student Training

PRIMARY	THIESIS (AH1FS)	UH1TRS
Basic Flight		
Straight and level flight	Yes	
Turns	Yes	
Hovering flight	Yes	Yes
Normal climbs	Yes	
Normal descents	Yes	
Hovering turns	Yes	
Climbing and ascending turns	Yes	
Deceleration/acceleration	Yes	Yes
Landing from hover	Yes	Yes
Traffic pattern	Yes	Yes
Normal approach	Yes	Yes
Traffic pattern entry	Yes	
Traffic pattern exit	Yes	
Running landing	Yes	
Presolo evaluation	Yes	Yes
Hovering taxi		Yes
Procedures		
Approach termination exercise	Yes	
Stagefield go-around	Yes	
Frequency change procedure	Yes	
Emergencies		
Hovering autorotation	Yes	
Standard autorotation	Yes	
Simulated engine failure	Yes	
Low RPM recovery	Yes	
Antioverspeed device	Yes	
Power recovery	Yes	
Precautionary landing	Yes	
Takeoff		
Normal takeoff	Yes	Yes

(Note: Blank spaces represent tasks not attempted in simulator or data not collected for task.)

autorotation, normal takeoff, traffic pattern, normal approach, and land from a hover. In these experiments, all students were trained to flight training grade standards by instructors qualified to teach primary phase. Generally, the maneuvers trained in the TRS exhibited positive transfer to the UH-1 aircraft on the maneuvers trained in the TRS. The results showed a correspondence between the number of maneuvers required in the simulator to reduce the maneuvers trained in the aircraft by one. For example, by performing a little more than two landings in the simulator, the requirement to perform landings in the UH-1 aircraft is reduced by one. For the IERW tasks, the following number of simulator maneuver testings were required to save one in the AH-1 aircraft:

Takeoff to hover	- 4.4
Hover taxi	- 1.9
Hovering turns	- 2.6
Hovering autorotation	- 5.9
Normal takeoff	- 4.8
Traffic pattern	- 2.2
Normal approach	- 3.6
Land from a hover	- 2.2

While a one-for-one substitution was not attained, these results indicated that a visual flight trainer was capable of providing effective training for these primary phase maneuvers in IERW. The UH1TRS was also used in an experiment where the first nine hours of simulator IERW primary training replaced the first nine hours of aircraft flight time. After simulator training, these ten students joined their cohorts on the flight line and continued with the IERW program. At the end of the first phase of training, an assessment of this group of pilots' proficiency indicated no difference between them and their classmates who were trained totally in the UH-1 aircraft. This serves as an additional indication of the value of a visual flight simulator in the early phases of flight training. Table 2 also lists the tasks trained by the UH1TRS.

CH-47

In 1979, ARIARDA conducted a two-phase training effectiveness evaluation of the CH-47 flight simulator (Holman, 1979). Phase I examined the simulator's value for training students undergoing transition to the CH-47 aircraft. During the transition course for the CH-47, the students were required to learn 32 separate tasks or maneuvers. The CH-47 flight simulator was designed to train 24 of these tasks. During this phase one group of students received their instruction in the simulator while a comparable group received all of their instruction in the CH-47 aircraft. At the end of their instructional program in the simulator, the simulator trained students were given checkrides

in the CH-47 aircraft. Table 3 summarizes the tasks which could be trained in the CH-47 flight simulator.

Phase II was aimed at determining the value of the trainer for periodic training of experienced CH-47 pilots. Pilots from FORSCOM units were divided into two groups. One was given 30 hours of simulator training over a six-month period and one of which conducted normal unit flight operations. Each pilot was given a checkride in the CH-47 aircraft both before and after the six-month period. The results indicated that there was a significant improvement in pilot performance in the group trained with the CH-47 flight simulator. These results are summarized in Table 3 under the Phase 2 column of CH47FS. The results of this evaluation revealed that the CH-47 simulator was effective in training a number of flying tasks. A few tasks were not well trained by the simulator, notably autorotations and external load operations. Most of the difficulties with training these tasks were due to limitations of the visual system. The adequacy of the out-the-window scene to provide depth cues was questionable for tasks which required maneuvering at low speeds very close to the ground. The night scene was also found to be questionable.

UH-60

ARIARDA was involved in the test of two alternative UH-60 flight simulators (Lucky, Bickley, Maxwell & Cirone, 1982). The systems tested were prototypes which consisted of two cockpits with two separate visual systems. One used a camera/modelboard visual system and the other used a digital image generation (DIG) visual system. To a large extent this evaluation was concerned with the comparison between these two types of visual systems. This study employed a transfer of training type of experimental design and included information about the transfer effectiveness of the tasks taught in this simulator to the UH-60 helicopter. The students came from the transition training classes at Fort Rucker during the period April through November 1981. The experimental group was trained in the simulator and received checkrides in the UH-60 aircraft. The transfer effectiveness ratios, which determine whether or not positive transfer of training occurred, were calculated for each task. Table 3 lists the tasks which were determined to be effectively trained by the UH-60 flight simulator with the DIG visual system. It is thought that the results of this system would be more consistent with the current inventory of Army flight simulators. For the UH-60 flight simulator with the DIG, the tasks which did not transfer to the aircraft were of two categories, instrument tasks and visual tasks requiring detailed depth perception.

AH-1

ARIARDA has conducted five experiments with the AH-1 Flight and Weapons Simulator (FWS). The first of these was a transfer

Table 3

Tasks Trained in Army Flight Simulators - ARIARDA Data, Skill Acquisition and Sustainment Training

	CH47FS Phase** 1 / 2	UH60FS	AH1FWS Experiment*** 1 / 2	AH1FWS Experiment*** 3 / 4	AH1FWS Gunnery	AH64CMS Gunnery
Procedures						
Cockpit procedures	Yes/Yes	Yes	Yes/			
Before landing checks		Yes				
Engine shut down		Yes				
IMC procedures		No				
ECU lockout		Yes				
Fuel management		Yes				
Vertical Helicopter Instrument Recovery Procedure (VHIRP)				Yes/		
FFAR ballistic procedures			Yes			
Basic Flight						
Hovering flight	Yes*/Yes	Yes	Yes/			
Traffic pattern	Yes*/Yes	Yes	Yes/			
Taxi - 2 & 4 wheel	Yes/Yes	Yes				
Decelerations	Yes/	No				
SAS/SCAS-off flight	Yes/	Yes	No/No	Yes/		
SAS-off hover		No				
Emergencies						
Standard autorotation	No/No	No	/No	No/Yes		
Stabilator malfunction		Yes				
Low level autorotation			Yes/No	Yes/No		
Dual hydraulic failure			Yes/No	Yes/No		
Right antitorque failure			Yes/Yes	No/Yes		
Low level high speed autorotation			Yes/No	No/No		
Manual throttle operation			/No	Yes/		
Forced landing, power recovery			Yes			

* CAN BE ACCOMPLISHED, BUT WITH DIFFICULTY

** CH47FS: Phase 1 - AQC
Phase 2 - Recurrent Training

*** AH1FWS: Exp 1 - AQC: Transfer of Training
" 2 - Emergency Procedures Backward Transfer
" 3 - Emergency Procedures: Skill Acquisition
" 4 - Emergency Touchdown Procedures: Transfer of Training

Table 3 (Cont'd)

Tasks Trained in Army Flight Simulators - ARIARDA Data, Skill Acquisition and Sustainment Training

	CH47FS Phase** 1 / 2	UH60FS	AH1FWS Experiment*** 1 / 2	AH1FWS Experiment*** 3 / 4	AH1FWS Gunnery	AH64CMS Gunnery
Emergencies (Cont'd)						
Autorotation to touchdown			Yes			
Autorotation with turn			Yes			
Autorotation, terminate w/power			No			
Hovering autorotation			Yes			
Left antitorque failure			Yes			
Takeoffs						
Instrument takeoff		Yes				
Takeoff to hover	Yes*/Yes	Yes	Yes/			
Normal takeoff	Yes*/Yes	Yes	Yes/			
Maximum performance T/O	Yes/Yes	Yes	Yes/			
Terrain flight takeoff		No	Yes/	Yes/		
Pinnacle takeoff		Yes				
Confined area takeoff		No				
Enroute						
Low level flight		No				
Contour flight		No				
High-speed flight			Yes			
Terrain flight			Yes			
Tactical Maneuvers						
External load procedures	Yes*/No	No				
High reconnaissance		Yes				
Internal loads		Yes				
Formation flight		No				
NOE acceleration/deceleration				Yes/		

* CAN BE ACCOMPLISHED, BUT WITH DIFFICULTY

** CH47FS: Phase 1 - AQC
Phase 2 - Recurrent Training

*** AH1FWS: Exp 1 - AQC: Transfer of Training
" 2 - Emergency Procedures Backward Transfer
" 3 - Emergency Procedures: Skill Acquisition
" 4 - Emergency Touchdown Procedures: Transfer of Training

Table 3 (Cont'd)

Tasks Trained in Army Flight Simulators - ARIARDA Data, Skill Acquisition and Sustainment Training

	CH47FS Phase** 1 / 2	UH60FS	AH1FWS Experiment*** 1 / 2	AH1FWS Experiment*** 3 / 4	AH1FWS Gunnery	AH64CMS Gunnery
Tactical Maneuvers (Cont'd)						
Mask/unmask				Yes/		
FFAR firing			Yes			
20/30mm gun			Yes/		Yes	No
Rockets			Yes		Yes	No
Missiles (TOW or Hellfire)					Yes	No
Approach						
VOR approach		No				
ADF approach		No				
ILS approach		No				
Normal approach	Yes*/Yes	Yes*	Yes/	Yes/		
Steep approach	Yes/Yes		Yes/			
Pinnacle approach	No/No	Yes				
Terrain flight approach		No	Yes/	Yes/		
Confined area approach		No				
Landings						
Landing from hover	Yes*/Yes	Yes				
Pinnacle landing	No/No	Yes				
Roll-on landing		No				
Single-engine roll-on landing		No		Yes/		
Shallow approach to running landing			Yes/No	Yes/		

* CAN BE ACCOMPLISHED, BUT WITH DIFFICULTY

** CH47FS: Phase 1 - AQC
Phase 2 - Recurrent Training

*** AH1FWS: Exp 1 - AQC: Transfer of Training
" 2 - Emergency Procedures Backward Transfer
" 3 - Emergency Procedures: Skill Acquisition
" 4 - Emergency Touchdown Procedures: Transfer of Training

of training experiment carried out using students transitioning to the AH-1 aircraft (Bickley, 1980). Some students received all of their training in the AH-1 aircraft, a comparison group received some training in the AH1FWS, and the remainder in the aircraft. This design allowed for the calculation of transfer effectiveness ratios which revealed the degree to which skills learned in the FWS transitioned to the aircraft. Of the 27 tasks evaluated in this experiment, two (autorotation termination with power and stability control augmentation system (SCAS)-off flight) were found to result in negative or negligible transfer to the AH-1. These results are detailed under experiment 1 of the AH1FWS column of Table 3. The second experimental investigation of the training effectiveness of the AH1FWS evaluated the simulator's ability to support experienced pilots' performance of emergency touchdown maneuvers (Kaempf, Cross & Blackwell, 1989). This type of design is called a backward transfer experiment. In this case, a group of skilled AH-1 pilots was given a checkride in the AH-1 aircraft and then required to perform the same maneuvers in the simulator. As can be seen from Table 3, AH1FWS experiment two, these aviators were only able to perform one of the emergency maneuvers in the simulator as well as they could in the aircraft. A survey of the aviators indicated that they attributed their difficulties to a lack of visual cues in the simulator. These results indicate that differences exist between the aircraft and the simulator in performing these maneuvers. The pilots were required to perform the tasks differently while flying the AH-1 aircraft than when flying the AH-1 flight simulator.

This led to a third experiment (Kaempf, Cross & Blackwell, 1989) in order to: (1) examine the level of proficiency that operational aviators can attain on certain tasks in the AH1FWS, (2) determine how much simulator training is required for operational aviators to reach proficiency on selected tasks in the AH1FWS, and (3) to increase the number of tasks evaluated to include some non-emergency maneuvers. The outcome of this third experiment with the AH1FS indicated that, in order to achieve levels of proficiency in the simulator which mirrored their proficiency in the AH-1 aircraft, aviators needed a considerable degree of familiarization on the tasks in the simulator. This experiment showed that the pilots could attain a level of proficiency in the simulator after an initial training period on all but four of the maneuvers examined. These results are detailed in Table 4 under the column labeled AH1FS experiment three.

It was concluded from this experiment that a forward transfer of training experiment was required to define the relationship between training conducted in the simulator and pilot performance in the aircraft. This research (Kaempf & Blackwell, 1990) concentrated on the training effectiveness of the AH1FWS for training transfer of five emergency touchdown

maneuvers. This research indicated that: (1) the aviators were not proficient on any of the five emergency touchdown maneuvers in the aircraft prior to simulator training and (2) the AH1FWS is moderately effective for training only two of the five emergency maneuvers (standard autorotation and right antitorque failure). These results are presented in Table 3 under the column AH1FWS experiment four.

The most recent inquiry conducted by ARIARDA concerning the AH1FWS addressed the effectiveness of the device for training aerial gunnery skills (McAnulty, 1992). This research looked at the value of the device for sustaining gunnery skills among aviators in units in Germany. These crews were given initial testing at the range on the AH-1 aircraft's weapons systems and were divided into two groups. One group was given periodic training in gunnery tasks on the AH1FWS while the other was not given any such training. At the end of a 15-month period, the crews were again required to qualify at the range. The data indicated that the AH1FWS did provide adequate training to sustain the gunnery skills of AH-1 crews for the 20mm gun, rockets, and TOW missiles. These results are provided in Table 3 under the AH1FWS column marked gunnery.

AH-64

In 1990, ARIARDA conducted a gunnery experiment, much like the one carried out on the AH1FWS, with the AH-64 Combat Mission Simulator (AH64CMS) (Hamilton, 1991). In this study, AH-64 crews accomplished weapons firing with the AH-64 helicopter at the range at Fort Hood, Texas. Subsequent to their live firing, one-half of the crews were given periodic training with the AH64CMS on gunnery skills while the other crews received no such simulator training, but did accomplish their normal unit flying. The original plan was to allow for a period of one year's time between the original range firing and the final live fire qualification for the groups. As a result of problems with scheduling and aircraft availability, the time between initial and final live firing was only a six-month period. The results of this effort revealed that no differences existed between the AH64CMS trained groups and the groups who received no AH64CMS training. The results of this experiment are reported on Table 4 under the column labeled AH64CMS gunnery. This experiment showed that a six-month period may be insufficient to show any degree of decay in gunnery skills for experienced AH-64 crews. This is consistent with an evaluation conducted by ARIARDA (Ruffner and Bickley, 1985) which showed the same to be true for generic flight tasks. In addition to this work, it is important to note that a more ambitious evaluation of the training value of the AH64CMS is currently being planned by ARIARDA. This evaluation will be carried out under the sponsorship of the Program Manager, Air Combat Training Systems of the Simulator Training and

Instrumentation Command (STRICOM). Data collection for this effort will be accomplished in FY94.

Discussion

The previous section gave a brief summary of the research carried out on Army flight simulators at ARIARDA. In general, there are a number of skills which can be successfully trained in current Army aviation flight simulators. These are detailed above and in the attached tables.

There are certain areas where improvements to the current inventory of flight simulators may pay great dividends to the Army. Gaps exist in the capability of many trainers to provide training which requires accurate visual ground and terrain references. This is true across the entire inventory of Army aviation simulators. Many of the tasks which result in poor or negative training are those which require such a visual reference (for example, autorotations and contour flight). While image generators and displays are becoming better and better at depicting the external world in flight simulators, little generalizable knowledge exists about what parameters of the visual scene are required by the pilot's visual system to allow successful accomplishment of some of these visually loaded tasks.

The data to be gathered using the STRATA system will lead to answers to such questions. Guidance about what areas to emphasize in the creation of visual databases for flight trainers will improve the utility of the simulators in the inventory and those to be procured. In addition, the implementation of a training based curriculum should provide for efficient use of the training devices currently on hand.

The evidence exists that the quality of the training system is enhanced by the way it is employed in the training program. It would be advisable to implement a quality control program which monitors the lesson plans and the actual performances of aviators in Army flight simulators. In this way, the quality of the training provided to Army aviators could be monitored and maintained at the highest level possible.

Improved training value can be provided by the inclusion of other advanced and current developmental technology into the Army aviation simulator inventory. Examples of such technology are automated performance measurement and feedback systems, intelligent flight training programs, and automated training management systems. Work is ongoing at ARIARDA to refine the concepts developed in the STRATA and the UH1TRS concerning the types of displays required for flight training systems and to provide an Intelligent Flight Training system. Aside from these technological improvements, more work should be focused upon the determination of the best way to provide team work skills for

improving force-on-force training for Army aircrews. Virtually no such skills are trained by the existing inventory of Army simulators.

Recommendations

Following from this examination of the training effectiveness research conducted by ARIARDA with Army aviation simulators, recommendations for the use of these systems and for their future potential are made below:

- The 2B24 appears to satisfy all requirements for training instrument skill for the UH-1 aircraft. Therefore, continued use of this simulator for the purpose of training these skills should be continued.

- The research carried out under the THIESIS project and with the UH1TRS indicates that great value can be derived from the use of visual flight trainers during the primary stage of IERW. This can be accomplished with substantial cost savings without degrading the quality of training. The addition of visual trainers to the inventory for this phase of training should be considered.

- Aside from the addition of visual trainers to primary flight training, the incorporation of advanced features such as self-instructional intelligent flight trainers should be seen as a way to produce well-trained students while reducing costs and training time.

- Based on the transfer of training work accomplished by ARIARDA, the results clearly indicate there is no training value for autorotations.

- As detailed in Table 3, the CH47FS can be used to train procedures and a number of flight tasks. Among these tasks are hovering tasks, taxis, takeoffs, traffic patterns, approaches, deceleration, and stability augmentation system (SAS)-off flight. This device was ineffective for training autorotation, external load procedures and pinnacle tasks.

- The UH60FS was found useful for training procedures, instrument takeoffs, hovering tasks, normal takeoffs, traffic patterns, normal approaches (with difficulty), taxi, pinnacle tasks, stability augmentation system (SAS)-off flight, ECU lockout, fuel management, high reconnaissance, and internal loads. This trainer was not effective for training instrument approaches, standard autorotations, external loads, decelerations, SAS-off hover, IMC procedures, roll-on landings, terrain, low level and contour flight, confined area operation or formation flight. The UH60FS should not be considered for these tasks.

- The AH1FWS is useful for training cockpit procedures, normal takeoffs and landings, high speed flight, accelerations/decelerations, and weapons tasks. The AH1FWS should not be used to train or practice stability control augmentation system (SCAS)-off flight. Two different experiments revealed no training value for this task in this device. Furthermore, autorotations should not be practiced in this simulator, moderate positive transfer of training was found for this class of task with the AH1FWS only for standard autorotation. No positive transfer was found for low-level, high speed autorotations, or dual hydraulic failure. Use of this simulator for practice of emergency maneuvers is not recommended.

- Gunnery tasks were sustained by the AH1FWS, but not by the AH64CMS. Use of the AH1FWS to maintain proficiency on gunnery skills is recommended. The value of the AH64CMS to sustain crew gunnery proficiency is not well established. ARIARDA is conducting an evaluation of this device at the present time. An earlier experiment, described above, did not show an effect for the use of the AH64CMS for sustaining gunnery skill over a six-month period (Hamilton, 1991; Ruffner and Bickley, 1985). It is likely that the period of time which elapsed between initial qualification and final evaluation was not long enough to allow these skills to deteriorate for the crews which did not use the AH64CMS. Judgement about the gunnery training effectiveness of the AH64CMS should be suspended until more data are available.

- Aside from the above specific recommendations, it is also suggested that the state of the current inventory of trainers be subjected to continuous evaluation to provide USAAVNC training managers with timely effectiveness information. Much of the research described above was carried out when the simulators were first introduced as part of the suitability of training evaluation. It is possible that some of these results could change with modifications and/or upgrades to the devices, the way they are used, or the attitude of the student population.

- A joint ARIARDA-USAAVNC simulator research advisory committee should be formed to guide the direction of the research conducted on ARIARDA and USAAVNC simulators. This committee should be able to suggest lines of inquiry which would yield the most value for the goal of improved training for Army aviation at the lowest possible cost. This research could be carried out in the operational environment or on the STRATA depending upon the nature of the issues to be addressed.

- Additional research effort could be useful in determining the training techniques and strategies, and the design of training simulators which will improve Army aviation's ability to

train team and unit level skills. Virtually no quantitative information exists at the present time.

- Further effort should be expended to determine the types of display content which would allow Army flight simulators to support the types of tasks listed above which are currently not trainable in simulators. ARIARDA's STRATA system is well-suited to this type of investigation and will be used in determining the answer to these questions.

It should be kept in mind that the value of the training systems and simulators used in any training program is a function of the design of the device itself, the way it is used in the program, and the efforts made to monitor continuously the quality of the instructional experience provided. A wider, systems approach to the instructional process, and the role simulators play in it, will pay dividends in the long run through higher quality graduates and greater returns on investments in funding, time, and effort.

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